



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

April 05, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10030026
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 03/24/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region 1 method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

A handwritten signature in black ink, appearing to read "David F. McDonald". The signature is written in a cursive, flowing style.

David F. McDonald
Biology Quality Assurance Officer

**Water Microbiology Laboratory
Data Qualifier Codes**

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
--- = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
SHAW01	AB03581	03/24/10 9:50 am	03/24/10 11:10 am	Enterococcus in Water	17329	10	

Number of Samples: 1



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Water Microbiology Laboratory Report

April 07, 2010

Todd Borci (OES04-4)
US EPA New England Region I

Project Number: 10030026
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 03/24/2010


Analytical Procedure:

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater
E. Coli Defined Substrate

Matrix: Water

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SHAW01	AB03581	03/24/10 9:50 am	03/24/10 11:10 am	E. Coli Defined Substrate	307600	1000	

Number of Samples: 1



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Laboratory Report

February 03, 2010

Todd Borci - SEW
US EPA New England Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 09080048
Project: RARE Stormwater
Analysis: HPLC/MS/MS Source Tracking Analysis
Analyst: Peter Philbrook *Peter Philbrook*
2-3-2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-LCMS_STA.0.

Date Samples Received by the Laboratory: 08/25/2009

Data were reviewed in accordance with the internal verification procedures described in the EPA New England OEME Chemistry QA Plan.

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Sincerely,

Daniel N Boudreau 2/8/10
Daniel N Boudreau
Chemistry Team Leader

DATA QUALIFIERS

RL	Reporting limit
J	Estimated value
E	Estimated value exceeds the calibration range
L	Estimated value is below the calibration range
B	Analyte is associated with the lab blank or trip blank contamination.
R	No recovery was calculated since the analyte concentration is greater than four times the spike level.
ND	Not Detected above Reporting limit
NA	Not Applicable due to high sample dilutions or sample interferences
ME	Matrix Effect - Sample matrix was responsible for either enhanced or suppressed ionization within the electrospray ionization probe

NARRATIVE

Aqueous samples (500mL) were extracted using a solid phase extraction (SPE) technique, following EPA Method 1694, in which samples were passed through a cartridge containing a solid sorbent material which pre-concentrates the target compounds onto the sorbent. The target compounds (TCs) were then eluted off the sorbent material using methanol. The resulting eluant is concentrated to dryness using nitrogen gas and re-constituted to a final volume of 1 mL with 20/80 Methanol/Water.

A 10uL aliquot of the sample extract was injected into a High Performance Liquid Chromatograph (HPLC), and the TCs were separated chromatographically using a C18 HPLC column running a methanol / water gradient. The ionization mode used was electrospray with the polarity operating in the positive mode. The TCs were detected using a Waters Acquity TQD Tandem Quadrupole Mass Spectrometer. The tandem quadrupole is used to perform multiple reaction monitoring (MRM) where the precursor ion of interest is fragmented to product ion(s).

Quantitation was performed by the internal standard calibration method using isotopically labeled cotinine d3 and carbamazepine d10 analogs. Caffeine *13*C3, and Primidone d5 were used as a surrogate compounds to monitor extraction efficiency.

The recoveries of cotinine and atenolol were unacceptably low using the SPE method outlined in EPA Method 1694. As a result all cotinine and atenolol values are estimated, and qualified with a "J".

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Dent 285
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97411
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2 & 10
pH: 7.14

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	100	20.0	
103-90-2	Acetaminophen	280	20.0	
29122-68-7	Atenolol	49	4.0	J
83905-01-5	Azithromycin	7.7	40.0	
58-08-2	Caffeine	230	40.0	
298-46-4	Carbamazepine	5.7	0.8	
486-56-6	Cotinine	4.7	0.8	J
125-33-7	Primidone	ND	8.0	
28925-89-5	Urobilin	3800	40.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	54	
Primidone d5	62	

Comments: J = Approximate values, Atenolol and Cotinine were not retained well on the solid phase extraction sorbent, LFB recoveries were below 25%.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Blue Up
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97412
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2
pH: 7.2

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	10	4.0	
103-90-2	Acetaminophen	10	4.0	
29122-68-7	Atenolol	ND	4.0	
83905-01-5	Azithromycin	ND	0.8	
58-08-2	Caffeine	96	8.0	
298-46-4	Carbamazepine	4.1	0.8	
486-56-6	Cotinine	ND	0.8	
125-33-7	Primidone	ND	8.0	
28925-89-5	Urobilin	39	8.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	121	
Primidone d5	95	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mother
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97413
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2
pH: 7.45

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	5.5	4.0	
103-90-2	Acetaminophen	ND	4.0	
29122-68-7	Atenolol	ND	4.0	
83905-01-5	Azithromycin	ND	0.8	
58-08-2	Caffeine	56	8.0	
298-46-4	Carbamazepine	14	0.8	
486-56-6	Cotinine	ND	0.8	
125-33-7	Primidone	ND	8.0	
28925-89-5	Urobilin	12	8.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	119	
Primidone d5	87	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: NR204
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 460 mL

Lab Sample ID: AA97414
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 100
pH: 8.03

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	11000	220.0	
103-90-2	Acetaminophen	65000	220.0	
29122-68-7	Atenolol	1800	220.0	J
83905-01-5	Azithromycin	280	44.0	
58-08-2	Caffeine	66000	440.0	
298-46-4	Carbamazepine	140	44.0	
486-56-6	Cotinine	51	44.0	J
125-33-7	Primidone	ND	440.0	
28925-89-5	Urobilin	340000	440.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	ND	
Primidone d5	ND	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: NR162
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 493 mL

Lab Sample ID: AA97415
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 100
pH: 7.94

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	7300	200.0	
103-90-2	Acetaminophen	590000	2000.0	
29122-68-7	Atenolol	ND	200.0	
83905-01-5	Azithromycin	ND	40.0	
58-08-2	Caffeine	4400	400.0	
298-46-4	Carbamazepine	ND	40.0	
486-56-6	Cotinine	ND	40.0	
125-33-7	Primidone	ND	400.0	
28925-89-5	Urobilin	110000	4000.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	ND	
Primidone d5	ND	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: UR013
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97416
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 100
pH: 7.93

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	7500	200.0	
103-90-2	Acetaminophen	600000	2000.0	
29122-68-7	Atenolol	ND	200.0	
83905-01-5	Azithromycin	ND	40.0	
58-08-2	Caffeine	4700	400.0	
298-46-4	Carbamazepine	ND	40.0	
486-56-6	Cotinine	ND	40.0	
125-33-7	Primidone	ND	400.0	
28925-89-5	Urobilin	110000	4000.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	ND	
Primidone d5	ND	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: NR160
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97417
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 10
pH: 7.64

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	280	20.0	
103-90-2	Acetaminophen	69	20.0	
29122-68-7	Atenolol	ND	20.0	
83905-01-5	Azithromycin	ND	4.0	
58-08-2	Caffeine	180	40.0	
298-46-4	Carbamazepine	ND	4.0	
486-56-6	Cotinine	4.0	4.0	J
125-33-7	Primidone	ND	40.0	
28925-89-5	Urobilin	5900	40.0	

Surrogate Compounds

Recoveries (%)

QC Ranges

Caffeine13C3
Primidone d5

86
71

Comments: J = Approximate values, Atenolol and Cotinine were not retained well on the solid phase extraction sorbent, LFB recoveries were below 25%.

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NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Esp01
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 520 mL

Lab Sample ID: AA97418
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2
pH: 7.23

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	8.2	3.8	
103-90-2	Acetaminophen	9.9	3.8	
29122-68-7	Atenolol	ND	3.8	
83905-01-5	Azithromycin	ND	0.8	
58-08-2	Caffeine	39	7.7	
298-46-4	Carbamazepine	4.6	0.8	
486-56-6	Cotinine	ND	0.8	
125-33-7	Primidone	ND	7.7	
28925-89-5	Urobilin	12	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	108	
Primidone d5	90	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Laboratory Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: N/A
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	ND	2.0	
103-90-2	Acetaminophen	ND	2.0	
29122-68-7	Atenolol	ND	2.0	
83905-01-5	Azithromycin	ND	0.4	
58-08-2	Caffeine	ND	4.0	
298-46-4	Carbamazepine	ND	0.4	
486-56-6	Cotinine	ND	0.4	
125-33-7	Primidone	ND	4.0	
28925-89-5	Urobilin	ND	4.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	98	
Primidone d5	88	

Comments:

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NEW ENGLAND LABORATORY

MATRIX SPIKE RECOVERY

RARE Stormwater

Sample ID: AA97417

PARAMETER	SPIKE ADDED ng/L	SAMPLE CONCENTRATION ng/L	MS CONCENTRATION ng/L	MS % REC	QC LIMITS (% REC)
1,7-Dimethylxanthine	120	280	330	41.7	50 - 150
Acetaminophen	120	69	150	67.5	50 - 150
Atenolol	120	ND	26	21.7	50 - 150
Azithromycin	24	ND	19	79.2	50 - 150
Caffeine	240	180	390	87.5	50 - 150
Carbamazepine	24	ND	20	83.3	50 - 150
Cotinine	24	4.0	5.9	7.92	50 - 150
Primidone	240	ND	190	79.2	50 - 150
Urobilin	240	5900	5900	N/A	50 - 150

LABORATORY DUPLICATE RESULTS

RARE Stormwater

Sample ID: AA97418

PARAMETER	SAMPLE RESULT ng/L	SAMPLE DUPLICATE RESULT ng/L	PRECISION RPD %	QC LIMITS
1,7-Dimethylxanthine	8.2	6.1	29.4	50
Acetaminophen	9.9	7.5	27.6	50
Atenolol	ND	ND	ND	50
Azithromycin	ND	ND	ND	50
Caffeine	39	38	2.60	50
Carbamazepine	4.6	4.2	9.09	50
Cotinine	ND	ND	ND	50
Primidone	ND	ND	ND	50
Urobilin	12	11	8.70	50

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

LABORATORY FORTIFIED BLANK (LFB) RECOVERY

RARE Stormwater

COMPOUND	SPIKE ADDED ng/L	LFB CONCENTRATION ng/L	LFB RECOVERY %	QC LIMITS (% REC)
1,7-Dimethylxanthine	120	55	45.8	50 - 138
Acetaminophen	120	120	100	50 - 120
Atenolol	120	24	20.0	50 - 150
Azithromycin	24	17	70.8	33 - 120
Caffeine	240	240	100	50 - 124
Carbamazepine	24	24	100	21 - 137
Cotinine	24	0.88	3.67	50 - 124
Primidone	240	210	87.5	50 - 150
Urobilin	240	110	45.8	50 - 150

Comments:

REGION 1

CHAIN OF CUSTODY RECORD

[illegible]

1- 17637



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Water Microbiology Laboratory Report

April 05, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10030026
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 03/24/2010

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NEW ENGLAND LABORATORY

RARE Stormwater

Enterococcus in Water

Matrix: Water

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April 07, 2010

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Project Number: 10030026
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Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater
E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
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Number of Samples: 1



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Laboratory Report

February 03, 2010

Todd Borci - SEW
US EPA New England Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 09080048
Project: RARE Stormwater
Analysis: HPLC/MS/MS Source Tracking Analysis
Analyst: Peter Philbrook *Peter Philbrook*
2-3-2010

Analytical Procedure:

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Daniel N Boudreau
Chemistry Team Leader

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R	No recovery was calculated since the analyte concentration is greater than four times the spike level.
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NARRATIVE

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The recoveries of cotinine and atenolol were unacceptably low using the SPE method outlined in EPA Method 1694. As a result all cotinine and atenolol values are estimated, and qualified with a "J".

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Dent 285
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97411
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2 & 10
pH: 7.14

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	100	20.0	
103-90-2	Acetaminophen	280	20.0	
29122-68-7	Atenolol	49	4.0	J
83905-01-5	Azithromycin	7.7	40.0	
58-08-2	Caffeine	230	40.0	
298-46-4	Carbamazepine	5.7	0.8	
486-56-6	Cotinine	4.7	0.8	J
125-33-7	Primidone	ND	8.0	
28925-89-5	Urobilin	3800	40.0	

Surrogate Compounds

Recoveries (%)

QC Ranges

Caffeine13C3
Primidone d5

54
62

Comments: J = Approximate values, Atenolol and Cotinine were not retained well on the solid phase extraction sorbent, LFB recoveries were below 25%.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Blue Up
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97412
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2
pH: 7.2

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	10	4.0	
103-90-2	Acetaminophen	10	4.0	
29122-68-7	Atenolol	ND	4.0	
83905-01-5	Azithromycin	ND	0.8	
58-08-2	Caffeine	96	8.0	
298-46-4	Carbamazepine	4.1	0.8	
486-56-6	Cotinine	ND	0.8	
125-33-7	Primidone	ND	8.0	
28925-89-5	Urobilin	39	8.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	121	
Primidone d5	95	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mother
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97413
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2
pH: 7.45

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	5.5	4.0	
103-90-2	Acetaminophen	ND	4.0	
29122-68-7	Atenolol	ND	4.0	
83905-01-5	Azithromycin	ND	0.8	
58-08-2	Caffeine	56	8.0	
298-46-4	Carbamazepine	14	0.8	
486-56-6	Cotinine	ND	0.8	
125-33-7	Primidone	ND	8.0	
28925-89-5	Urobilin	12	8.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	119	
Primidone d5	87	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: NR204
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 460 mL

Lab Sample ID: AA97414
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 100
pH: 8.03

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	11000	220.0	
103-90-2	Acetaminophen	65000	220.0	
29122-68-7	Atenolol	1800	220.0	J
83905-01-5	Azithromycin	280	44.0	
58-08-2	Caffeine	66000	440.0	
298-46-4	Carbamazepine	140	44.0	
486-56-6	Cotinine	51	44.0	J
125-33-7	Primidone	ND	440.0	
28925-89-5	Urobilin	340000	440.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	ND	
Primidone d5	ND	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: NR162
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 493 mL

Lab Sample ID: AA97415
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 100
pH: 7.94

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	7300	200.0	
103-90-2	Acetaminophen	590000	2000.0	
29122-68-7	Atenolol	ND	200.0	
83905-01-5	Azithromycin	ND	40.0	
58-08-2	Caffeine	4400	400.0	
298-46-4	Carbamazepine	ND	40.0	
486-56-6	Cotinine	ND	40.0	
125-33-7	Primidone	ND	400.0	
28925-89-5	Urobilin	110000	4000.0	

Surrogate Compounds

Recoveries (%)

QC Ranges

Caffeine13C3
Primidone d5

ND
ND

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: UR013
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97416
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 100
pH: 7.93

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	7500	200.0	
103-90-2	Acetaminophen	600000	2000.0	
29122-68-7	Atenolol	ND	200.0	
83905-01-5	Azithromycin	ND	40.0	
58-08-2	Caffeine	4700	400.0	
298-46-4	Carbamazepine	ND	40.0	
486-56-6	Cotinine	ND	40.0	
125-33-7	Primidone	ND	400.0	
28925-89-5	Urobilin	110000	4000.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	ND	
Primidone d5	ND	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: NR160
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: AA97417
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 10
pH: 7.64

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	280	20.0	
103-90-2	Acetaminophen	69	20.0	
29122-68-7	Atenolol	ND	20.0	
83905-01-5	Azithromycin	ND	4.0	
58-08-2	Caffeine	180	40.0	
298-46-4	Carbamazepine	ND	4.0	
486-56-6	Cotinine	4.0	4.0	J
125-33-7	Primidone	ND	40.0	
28925-89-5	Urobilin	5900	40.0	

Surrogate Compounds

Recoveries (%)

QC Ranges

Caffeine13C3
Primidone d5

86
71

Comments: J = Approximate values, Atenolol and Cotinine were not retained well on the solid phase extraction sorbent, LFB recoveries were below 25%.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Esp01
Date of Collection: 8/25/2009
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 520 mL

Lab Sample ID: AA97418
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 2
pH: 7.23

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	8.2	3.8	
103-90-2	Acetaminophen	9.9	3.8	
29122-68-7	Atenolol	ND	3.8	
83905-01-5	Azithromycin	ND	0.8	
58-08-2	Caffeine	39	7.7	
298-46-4	Carbamazepine	4.6	0.8	
486-56-6	Cotinine	ND	0.8	
125-33-7	Primidone	ND	7.7	
28925-89-5	Urobilin	12	7.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
Caffeine13C3	108	
Primidone d5	90	

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Laboratory Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Extraction: 08/26/2009
Date of Analysis: 01/20/2010
Volume Extracted: 500 mL

Lab Sample ID: N/A
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	ND	2.0	
103-90-2	Acetaminophen	ND	2.0	
29122-68-7	Atenolol	ND	2.0	
83905-01-5	Azithromycin	ND	0.4	
58-08-2	Caffeine	ND	4.0	
298-46-4	Carbamazepine	ND	0.4	
486-56-6	Cotinine	ND	0.4	
125-33-7	Primidone	ND	4.0	
28925-89-5	Urobilin	ND	4.0	

Surrogate Compounds

Recoveries (%)

QC Ranges

Caffeine13C3
Primidone d5

98
88

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

MATRIX SPIKE RECOVERY

RARE Stormwater

Sample ID: AA97417

PARAMETER	SPIKE ADDED ng/L	SAMPLE CONCENTRATION ng/L	MS CONCENTRATION ng/L	MS % REC	QC LIMITS (% REC)
1,7-Dimethylxanthine	120	280	330	41.7	50 - 150
Acetaminophen	120	69	150	67.5	50 - 150
Atenolol	120	ND	26	21.7	50 - 150
Azithromycin	24	ND	19	79.2	50 - 150
Caffeine	240	180	390	87.5	50 - 150
Carbamazepine	24	ND	20	83.3	50 - 150
Cotinine	24	4.0	5.9	7.92	50 - 150
Primidone	240	ND	190	79.2	50 - 150
Urobilin	240	5900	5900	N/A	50 - 150

LABORATORY DUPLICATE RESULTS

RARE Stormwater

Sample ID: AA97418

PARAMETER	SAMPLE RESULT ng/L	SAMPLE DUPLICATE RESULT ng/L	PRECISION RPD %	QC LIMITS
1,7-Dimethylxanthine	8.2	6.1	29.4	50
Acetaminophen	9.9	7.5	27.6	50
Atenolol	ND	ND	ND	50
Azithromycin	ND	ND	ND	50
Caffeine	39	38	2.60	50
Carbamazepine	4.6	4.2	9.09	50
Cotinine	ND	ND	ND	50
Primidone	ND	ND	ND	50
Urobilin	12	11	8.70	50

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

LABORATORY FORTIFIED BLANK (LFB) RECOVERY

RARE Stormwater

COMPOUND	SPIKE ADDED ng/L	LFB CONCENTRATION ng/L	LFB RECOVERY %	QC LIMITS (% REC)
1,7-Dimethylxanthine	120	55	45.8	50 - 138
Acetaminophen	120	120	100	50 - 120
Atenolol	120	24	20.0	50 - 150
Azithromycin	24	17	70.8	33 - 120
Caffeine	240	240	100	50 - 124
Carbamazepine	24	24	100	21 - 137
Cotinine	24	0.88	3.67	50 - 124
Primidone	240	210	87.5	50 - 150
Urobilin	240	110	45.8	50 - 150

Comments:

REGION 1

CHAIN OF CUSTODY RECORD

[illegible]

1- 17637



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

June 14, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10060018
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 06/10/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
- - - = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
SLE3a	AB06438	06/10/10 7:25 am	06/10/10 11:25 am	E. Coli Defined Substrate	1954	4	
SLE3b	AB06439	06/10/10 8:25 am	06/10/10 11:25 am	E. Coli Defined Substrate	899	4	
SLE3c	AB06441	06/10/10 9:00 am	06/10/10 11:25 am	E. Coli Defined Substrate	806	4	
UR027	AB06440	06/10/10 7:25 am	06/10/10 11:25 am	E. Coli Defined Substrate	1741	4	

Number of Samples: 4



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

June 14, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10060018
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 06/10/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

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David F. McDonald
Biology Laboratory Manager

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater
Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
SLE3a	AB06438	06/10/10 7:25 am	06/10/10 11:25 am	Enterococcus in Water	2359	10	
SLE3b	AB06439	06/10/10 8:25 am	06/10/10 11:25 am	Enterococcus in Water	4884	10	
SLE3c	AB06441	06/10/10 9:00 am	06/10/10 11:25 am	Enterococcus in Water	2014	10	
UR027	AB06440	06/10/10 7:25 am	06/10/10 11:25 am	Enterococcus in Water	1314	10	

Number of Samples: 4



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

October 18, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10100019
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 10/13/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

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Sincerely,

David F. McDonald
Biology Laboratory Manager

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P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
D Launch	AB11528	10/13/10 8:15 am	10/13/10 1:45 pm	E. Coli Defined Substrate	1376	4	
MH Winslo	AB11536	10/13/10 11:11 am	10/13/10 1:45 pm	E. Coli Defined Substrate	2452	4	
MH Winsta	AB11537	10/13/10 11:28 am	10/13/10 1:45 pm	E. Coli Defined Substrate	43	4	
MH19	AB11530	10/13/10 8:38 am	10/13/10 1:45 pm	E. Coli Defined Substrate	TNTC	4	
MH2203	AB11535	10/13/10 10:55 am	10/13/10 1:45 pm	E. Coli Defined Substrate	5654	4	
MH2336	AB11534	10/13/10 10:38 am	10/13/10 1:45 pm	E. Coli Defined Substrate	5654	4	
MH29A	AB11533	10/13/10 9:55 am	10/13/10 1:45 pm	E. Coli Defined Substrate	689	4	
MH32	AB11531	10/13/10 9:10 am	10/13/10 1:45 pm	E. Coli Defined Substrate	118	4	
MH48	AB11532	10/13/10 9:30 am	10/13/10 1:45 pm	E. Coli Defined Substrate	8	4	
UR038	AB11529	10/13/10 8:15 am	10/13/10 1:45 pm	E. Coli Defined Substrate	871	4	

Number of Samples: 10



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

October 18, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10100019
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 10/13/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

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David F. McDonald
Biology Laboratory Manager

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- - - = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
D Launch	AB11528	10/13/10 8:15 am	10/13/10 1:45 pm	Enterococcus in Water	860	10	
MH Winslo	AB11536	10/13/10 11:11 am	10/13/10 1:45 pm	Enterococcus in Water	118	10	
MH Winsta	AB11537	10/13/10 11:28 am	10/13/10 1:45 pm	Enterococcus in Water	98	10	
MH19	AB11530	10/13/10 8:38 am	10/13/10 1:45 pm	Enterococcus in Water	24196	10	
MH2203	AB11535	10/13/10 10:55 am	10/13/10 1:45 pm	Enterococcus in Water	5475	10	
MH2336	AB11534	10/13/10 10:38 am	10/13/10 1:45 pm	Enterococcus in Water	2489	10	
MH29A	AB11533	10/13/10 9:55 am	10/13/10 1:45 pm	Enterococcus in Water	41	10	
MH32	AB11531	10/13/10 9:10 am	10/13/10 1:45 pm	Enterococcus in Water	10	10	
MH48	AB11532	10/13/10 9:30 am	10/13/10 1:45 pm	Enterococcus in Water	ND	10	
UR038	AB11529	10/13/10 8:15 am	10/13/10 1:45 pm	Enterococcus in Water	723	10	

Number of Samples: 10



ANALYTICAL REPORT

Lab Number: L0911797

Client: U.S. EPA
N.E. Regional Lab-Office of Env. Meas.
11 Technology Drive
North Chelmsford, MA 01863-2431

ATTN: Vicki Maynard *DB from 9/3/09*

Project Name: RARE

Project Number: 09080048

Report Date: 09/01/09

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (2003), NJ (MA935), RI (LAO00065), ME (MA0086), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L0911797-01	DENT285	Not Specified	08/25/09 07:50
L0911797-02	BLUE UP	Not Specified	08/25/09 08:00
L0911797-03	MOTHER	Not Specified	08/25/09 09:05
L0911797-04	NR204	Not Specified	08/25/09 10:00
L0911797-05	NR162	Not Specified	08/25/09 11:00
L0911797-06	UR013	Not Specified	08/25/09 11:00
L0911797-07	NR160	Not Specified	08/25/09 12:00
L0911797-08	ESP01	Not Specified	08/25/09 12:02

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

For additional information, please contact Client Services at 800-624-9220.

Surfactants, MBAS

L0911797-04 has an elevated detection limit due to the dilution required to quantitate the result within the calibration range.

Chlorine, Total Residual

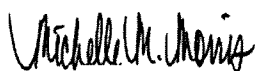
WG377059: A Laboratory Duplicate could not be performed due to insufficient sample volume available for analysis.

Chlorine, Residual Free

WG377060: A Laboratory Duplicate could not be performed due to insufficient sample volume available for analysis.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Title: Technical Director/Representative

Date: 09/01/09

METALS

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-01
Client ID: DENT285
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 07:50
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab										
Potassium, Total	3.4		mg/l	2.5	1	08/27/09 12:45	08/28/09 17:32	EPA 3005A	1,6010B	AI



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-02
Client ID: BLUE UP
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 08:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	ND		mg/l	2.5	1	08/27/09 12:45	08/28/09 17:49	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-03
Client ID: MOTHER
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 09:05
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab										
Potassium, Total	3.7		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:02	EPA 3005A	1,6010B	AI



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-04
Client ID: NR204
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 10:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	8.7		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:06	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-05
Client ID: NR162
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab										
Potassium, Total	7.4		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:11	EPA 3005A	1,6010B	AI



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-06
Client ID: UR013
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	7.2		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:15	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-07
Client ID: NR160
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	4.8		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:19	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-08
Client ID: ESP01
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:02
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	ND		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:24	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Westborough Lab for sample(s): 01-08 Batch: WG377416-1								
Potassium, Total	ND	mg/l	2.5	1	08/27/09 12:45	08/28/09 17:19	1,6010B	AI

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01-08 Batch: WG377416-2					
Potassium, Total	100	-	80-120	-	

Matrix Spike Analysis Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377416-4 QC Sample: L0911797-01 Client ID: DENT285									
Potassium, Total	3.4	10	14	106	-	-	75-125	-	20

Lab Duplicate Analysis
Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377416-3 QC Sample: L0911797-01 Client ID: DENT285					
Potassium, Total	3.4	3.4	mg/l	0	20



INORGANICS & MISCELLANEOUS

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-01
Client ID: DENT285
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 07:50
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	0.400		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:28	30,4500NH3-BH	AT
Surfactants, MBAS	0.22		mg/l	0.05	1	-	08/26/09 19:21	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-02
Client ID: BLUE UP
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 08:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	ND		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:28	30,4500NH3-BH	AT
Surfactants, MBAS	0.05		mg/l	0.05	1	-	08/26/09 19:22	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-03
Client ID: MOTHER
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 09:05
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	ND		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:29	30,4500NH3-BH	AT
Surfactants, MBAS	0.06		mg/l	0.05	1	-	08/26/09 19:22	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-04
Client ID: NR204
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 10:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	0.56		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	20.1		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:30	30,4500NH3-BH	AT
Surfactants, MBAS	8.7		mg/l	0.50	10	-	08/26/09 20:45	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-05
Client ID: NR162
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	0.55		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	13.2		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:31	30,4500NH3-BH	AT
Surfactants, MBAS	0.89		mg/l	0.05	1	-	08/26/09 19:24	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-06
Client ID: UR013
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	0.62		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	12.4		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:32	30,4500NH3-BH	AT
Surfactants, MBAS	0.92		mg/l	0.05	1	-	08/26/09 19:25	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-07
Client ID: NR160
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/28/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	0.598		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:33	30,4500NH3-BH	AT
Surfactants, MBAS	0.05		mg/l	0.05	1	-	08/26/09 20:47	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-08
Client ID: ESP01
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:02
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/28/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	0.10		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:33	30,4500NH3-BH	AT
Surfactants, MBAS	0.07		mg/l	0.05	1	-	08/26/09 20:48	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377059-1								
Chlorine, Total Residual	ND	mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377060-1								
Chlorine, Residual Free	ND	mg/l	0.05	1	-		30,4500CL-D	BH
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377218-1								
Surfactants, MBAS	ND	mg/l	0.05	1	-	08/26/09 19:19	30,5540C	BH
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377327-1								
Nitrogen, Ammonia	ND	mg/l	0.075	1	08/27/09 11:45	08/27/09 17:01	30,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-06 Batch: WG377695-1								
Fluoride	ND	mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
General Chemistry - Westborough Lab for sample(s): 07-08 Batch: WG377696-1								
Fluoride	ND	mg/l	0.20	1	08/28/09 11:00	08/29/09 11:00	30,4500F-BC	ST



Lab Control Sample Analysis Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377059-2					
Chlorine, Total Residual	93	-		-	
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377060-2					
Chlorine, Residual Free	94	-		-	
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377218-2					
Surfactants, MBAS	92	-	65-126	-	
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377327-2					
Nitrogen, Ammonia	98	-	80-120	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-06 Batch: WG377695-2					
Fluoride	92	-	78-115	-	
General Chemistry - Westborough Lab Associated sample(s): 07-08 Batch: WG377696-2					
Fluoride	97	-	78-115	-	

Matrix Spike Analysis **Batch Quality Control**

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377218-4 QC Sample: L0911797-02 Client ID: BLUE UP									
Surfactants, MBAS	0.05	0.24	0.34	121	-	-	52-157	-	32
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377327-3 QC Sample: L0911437-01 Client ID: MS Sample									
Nitrogen, Ammonia	0.339	4	4.23	97	-	-	80-120	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG377695-3 QC Sample: L0911797-01 Client ID: DENT285									
Fluoride	ND	1	1.1	106	-	-	69-124	-	13
General Chemistry - Westborough Lab Associated sample(s): 07-08 QC Batch ID: WG377696-3 QC Sample: L0911797-08 Client ID: ESP01									
Fluoride	ND	1	1.0	100	-	-	69-124	-	13

*Is this a
 problem the
 RPDs aren't
 reported?*

Lab Duplicate Analysis Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377218-3 QC Sample: L0911797-01 Client ID: DENT285					
Surfactants, MBAS	0.22	0.21	mg/l	5	32
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377327-4 QC Sample: L0911437-01 Client ID: DUP Sample					
Nitrogen, Ammonia	0.339	0.349	mg/l	3	20
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG377695-4 QC Sample: L0911797-01 Client ID: DENT285					
Fluoride	ND	ND	mg/l	NC	13
General Chemistry - Westborough Lab Associated sample(s): 07-08 QC Batch ID: WG377696-4 QC Sample: L0911797-08 Client ID: ESP01					
Fluoride	ND	ND	mg/l	NC	13

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler Custody Seal
A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis
L0911797-01A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-01B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-01C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-01D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-01E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-02A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-02B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-02C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-02D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-02E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-03A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-03B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-03C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-03D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-03E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-04A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-04B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-04C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-04D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-04E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-05A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-05B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-05C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-05D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-05E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-06A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-06B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-06C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-06D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-06E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)

*Hold days indicated by values in parentheses



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis
L0911797-07A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-07B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-07C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-07D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-07E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-08A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-08B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-08C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-08D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-08E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)

Container Comments

L0911797-01A
L0911797-02A
L0911797-04C

*Hold days indicated by values in parentheses



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

GLOSSARY

Acronyms

- EPA - Environmental Protection Agency.
- LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD - Laboratory Control Sample Duplicate: Refer to LCS.
- MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD - Matrix Spike Sample Duplicate: Refer to MS.
- NA - Not Applicable.
- NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND - Not detected at the reported detection limit for the sample.
- NI - Not Ignitable.
- RDL - Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RDL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

Report Format: Data Usability Report



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.
- 30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certificate/Approval Program Summary

Last revised August 27, 2009 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. **NELAP Accredited Solid Waste/Soil.**

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Haloacetic Acids, Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP), Ethylene Dibromide (EDB).)

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Calcium Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics.)

Solid Waste/Soil (Inorganic Parameters: Lead in Paint, pH, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), Reactivity. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP(Silvex), Volatile Organics, Acid Extractables (Phenols), 3,3'-Dichlorobenzidine, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.

Drinking Water (Inorganic Parameters: SM9215B, 9221E, 9222B, 9222D, 9223B, EPA 180.1, 300.0, 353.2, SM2130B, 2320B, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1. Organic Parameters: 504.1, 524.2, SM 6251B.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, Lachat 10-107-06-1-B, SM2320B, 2340B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NH3-H, 4500NO3-F, 4500P-B.5, 4500P-E, 5210B, 5220D, 5310C, EPA 200.7, 200.8, 245.1. Organic Parameters: 608, 624.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.

Drinking Water

Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl)

(EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Nitrite-N, Fluoride, Sulfate)

353.2 for: Nitrate-N, Nitrite-N; SM4500NO3-F, 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B.

Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics)

(504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), SM6251B, 314.0.

Non-Potable Water

Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn)

(EPA 200.7 for: Al,Sb,As,Be,Cd,Cr,Co,Cu,Fe,Pb,Mn,Mo,Ni,Se,Ag,Sr,Tl,Ti,V,Zn,Ca,Mg,Na,K)

245.1, SM4500H,B, EPA 120.1, SM2510B, 2540C, 2540B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Nitrate-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-B,C-Titr, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CN-CE, 2540D, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1

Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics)

(608 for: Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, PCB-Water)

600/4-81-045-PCB-Oil

Drinking Water

Microbiology Parameters: SM9215B; MF-SM9222B; ENZ. SUB. SM9223; EC-SM9221E; MF-SM9222D;

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM6215B, 9222B, 9223B Colilert, EPA 200.7, 200.8, 245.2, 120.1, 300.0, 314.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 331.0. *Organic Parameters:* 504.1, 524.2, SM6251B.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6020, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 351.1, 353.2, 420.1, 1664A, SW-846 9010, 9030, 9040B, SM426C, SM2310B, 2540B, 2540D, 4500H+B, 4500NH3-H, 4500NH3-E, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 2320B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-117-07-1-B, LACHAT 10-107-06-1-B, LACHAT 10-107-04-1-C, LACHAT 10-107-04-1-J, LACHAT 10-117-07-1-A, SM4500CL-E, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. *Organic Parameters:* SW-846 3005A, 3015A, 3510C, 5030B, 8021B, 8260B, 8270C, 8330, EPA 624, 625, 608, SW-846 8082, 8081A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 7196A, 7471A, 7.3.3.2, 7.3.4.2, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040, 9045C, 9050C, 1311, 3005A, 3050B, 3051A. *Organic Parameters:* SW-846 3540C, 3545, 3580A, 5030B, 5035, 8021B, 8260B, 8270C, 8330, 8151A, 8082, 8081A.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 2540C, 2320B, 314.0, SM2120B, 2510B, 5310C, SM4500H-B, EPA 200.8, 245.2. *Organic Parameters:* 504.1, SM6251B, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500CI-D, EPA 300.0, SM2120B, SM4500F-BC, EPA 200.7, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM4500P-B5+E, 2540B, 2540C, 2540D, EPA 120.1, SM2510B, SM15 426C, SM9221CE, 9222D, 9221B, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, SM5210B, SW-846 3015, 6020, 7470A, 5540C, 4500H-B, EPA 200.8, SM3500Cr-D, EPA 245.1, 245.2, SW-846 9040B, 3005A, EPA 6010B, 7196A, SW-846 9010B, 9030B. *Organic Parameters:* SW-846 8260B, 8270C, 3510C, EPA 608, 624, 625, SW-846 5030B, 8021B, 8081A, 8082, 8151A, 8330, NJ OQA-QAM-025 Rev.7.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 9040B, 3005A, 6010B, 7196A, 5030B, 9010B, 9030B, 1030, 1311, 3050B, 3051, 7471A, 9014, 9012A, 9045C, 9050A, 9065. *Organic Parameters:* SW-846 8021B, 8081A, 8082, 8151A, 8330, 8260B, 8270C, 1311, 1312, 3540C, 3545, 3550B, 3580A, 5035L, 5035H, NJ OQA-QAM-025 Rev.7.)

New York Department of Health Certificate/Lab ID: 11148. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9223B, 9222B, 8215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 314.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500H-B, 4500NO3-F, 2540C, EPA 120.1, SM 2510B. *Organic Parameters:* EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, LACHAT 10-117-07-1A or B, SM4500CI-E, 4500F-C, SM15 426C, EPA 350.1, LACHAT 10-107-06-1-B, SM4500NH3-H, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, LACHAT 10-107-041-C, SM4500-NO30F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6020, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, SM4500-CN-E LACHAT 10-204-00-1-A, EPA 9040B, SM4500-HB, EPA 1664A, SM5310C, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015. *Organic Parameters:* EPA 624, 8260B, 8270C, 625, 608, 8081A, 8151A, 8330, 8082, 8021B, EPA 3510C, 5030B, 9010B, 9030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 9040B, 9045C, 1010, 1030, SW-846 Ch 7 Sec 7.3, EPA 6010B, 7196A, 7471A, 9012A, 9014, 9040B, 9045C, 9065, 9050, EPA 1311, 3005A, 3050B, 9010B, 9030B. *Organic Parameters:* EPA 8260B, 8270C, 8081A, 8151A, 8330, 8082, 8021B, 3540C, 3545, 3580, 5030B, 5035.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. NELAP Accredited.

Non-Potable Water (Organic Parameters: EPA 3510C, 625, 608, 8081A, 8082, 8151A, 8270C, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, 1311, 3050B, 3051, 6010B, EPA 7.3.3.2, EPA 7.3.4.2, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065. *Organic Parameters:* 3540C, 3545, 3580A, 5035, 8021B, 8081A, 8082, 8151A, 8260B, 8270C, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. NELAP Accredited via NY-DOH.

Refer to MA-DEP Certificate for Potable and Non-Potable Water.

Refer to NY-DOH Certificate for Potable and Non-Potable Water.

Utah Department of Health Certificate/Lab ID: AAMA. NELAP Accredited.

Non-Potable Water (Inorganic Parameters: Chloride EPA 300.0)

Non-NELAC Approved Analytes

The following analytes are considered non-NELAC certifiable parameters: 8260B: Freon-113, Diisopropyl Ether, 8330A: PETN; Picric Acid; Nitroglycerine; 2,6-DANT; 2,4-DANT)



REGION 1

CHAIN OF CUSTODY RECORD

Alpha

Page 36 of 36



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

August 31, 2009

Todd Borci - SEW
US EPA New England Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 09080048
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Emily Bouthiette

Date Samples Received by the Laboratory: 08/25/2009

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Quality Assurance Officer

Water Microbiology Laboratory Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
- - - = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Coll	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
Blue Up	AA97412	08/25/09 8:00 an	08/25/09 1:45 pm	E. Coli Defined Substrate	226	4	
Dent 285	AA97411	08/25/09 7:50 an	08/25/09 1:45 pm	E. Coli Defined Substrate	33000	4	
Esp01	AA97418	08/25/09 12:02 p	08/25/09 1:45 pm	E. Coli Defined Substrate	241	4	
Mother	AA97413	08/25/09 9:05 an	08/25/09 1:45 pm	E. Coli Defined Substrate	129	4	
NR160	AA97417	08/25/09 12:00 p	08/25/09 1:45 pm	E. Coli Defined Substrate	1741	4	
NR162	AA97415	08/25/09 11:00 ai	08/25/09 1:45 pm	E. Coli Defined Substrate	198630	4	
NR204	AA97414	08/25/09 10:00 ai	08/25/09 1:45 pm	E. Coli Defined Substrate	>241960	4	J
UR013	AA97416	08/25/09 11:00 ai	08/25/09 1:45 pm	E. Coli Defined Substrate	241960	4	

Number of Samples: 8



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

August 31, 2009

Todd Borci - SEW
US EPA New England Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 09080048
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Emily Bouthiette

Date Samples Received by the Laboratory: 08/25/2009

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Quality Assurance Officer

Water Microbiology Laboratory Data Qualifier Codes

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H = Exceeds holding time
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S = Lost sample
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P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Coll	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
Blue Up	AA97412	08/25/09 8:00 an	08/25/09 1:45 pm	Enterococcus in Water	64	10	
Dent 285	AA97411	08/25/09 7:50 an	08/25/09 1:45 pm	Enterococcus in Water	3683	10	
Esp01	AA97418	08/25/09 12:02 p	08/25/09 1:45 pm	Enterococcus in Water	58	10	
Mother	AA97413	08/25/09 9:05 an	08/25/09 1:45 pm	Enterococcus in Water	56	10	
NR160	AA97417	08/25/09 12:00 p	08/25/09 1:45 pm	Enterococcus in Water	149	10	
NR162	AA97415	08/25/09 11:00 ai	08/25/09 1:45 pm	Enterococcus in Water	5226	10	
NR204	AA97414	08/25/09 10:00 ai	08/25/09 1:45 pm	Enterococcus in Water	>48392	10	J
UR013	AA97416	08/25/09 11:00 ai	08/25/09 1:45 pm	Enterococcus in Water	5510	10	

Number of Samples: 8



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

June 14, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10060018
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 06/10/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
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+++ = Positive control
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L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
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P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater
Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
SLE3a	AB06438	06/10/10 7:25 am	06/10/10 11:25 am	Enterococcus in Water	2359	10	
SLE3b	AB06439	06/10/10 8:25 am	06/10/10 11:25 am	Enterococcus in Water	4884	10	
SLE3c	AB06441	06/10/10 9:00 am	06/10/10 11:25 am	Enterococcus in Water	2014	10	
UR027	AB06440	06/10/10 7:25 am	06/10/10 11:25 am	Enterococcus in Water	1314	10	

Number of Samples: 4



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

June 14, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10060018
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 06/10/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
- - - = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
SLE3a	AB06438	06/10/10 7:25 am	06/10/10 11:25 am	E. Coli Defined Substrate	1954	4	
SLE3b	AB06439	06/10/10 8:25 am	06/10/10 11:25 am	E. Coli Defined Substrate	899	4	
SLE3c	AB06441	06/10/10 9:00 am	06/10/10 11:25 am	E. Coli Defined Substrate	806	4	
UR027	AB06440	06/10/10 7:25 am	06/10/10 11:25 am	E. Coli Defined Substrate	1741	4	

Number of Samples: 4



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

October 18, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10100019
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 10/13/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory Data Qualifier Codes

J = Estimate
H = Exceeds holding time
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At = Atypical overgrowth
S = Lost sample
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MB = Media blank
+++ = Positive control
- - - = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
D Launch	AB11528	10/13/10 8:15 am	10/13/10 1:45 pm	E. Coli Defined Substrate	1376	4	
MH Winslo	AB11536	10/13/10 11:11 am	10/13/10 1:45 pm	E. Coli Defined Substrate	2452	4	
MH Winsta	AB11537	10/13/10 11:28 am	10/13/10 1:45 pm	E. Coli Defined Substrate	43	4	
MH19	AB11530	10/13/10 8:38 am	10/13/10 1:45 pm	E. Coli Defined Substrate	TNTC	4	
MH2203	AB11535	10/13/10 10:55 am	10/13/10 1:45 pm	E. Coli Defined Substrate	5654	4	
MH2336	AB11534	10/13/10 10:38 am	10/13/10 1:45 pm	E. Coli Defined Substrate	5654	4	
MH29A	AB11533	10/13/10 9:55 am	10/13/10 1:45 pm	E. Coli Defined Substrate	689	4	
MH32	AB11531	10/13/10 9:10 am	10/13/10 1:45 pm	E. Coli Defined Substrate	118	4	
MH48	AB11532	10/13/10 9:30 am	10/13/10 1:45 pm	E. Coli Defined Substrate	8	4	
UR038	AB11529	10/13/10 8:15 am	10/13/10 1:45 pm	E. Coli Defined Substrate	871	4	

Number of Samples: 10



ANALYTICAL REPORT

Lab Number: L0911797

Client: U.S. EPA
N.E. Regional Lab-Office of Env. Meas.
11 Technology Drive
North Chelmsford, MA 01863-2431

ATTN: Vicki Maynard *DB from 9/3/09*

Project Name: RARE

Project Number: 09080048

Report Date: 09/01/09

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (2003), NJ (MA935), RI (LAO00065), ME (MA0086), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Alpha Sample ID	Client ID	Sample Location	Collection Date/Time
L0911797-01	DENT285	Not Specified	08/25/09 07:50
L0911797-02	BLUE UP	Not Specified	08/25/09 08:00
L0911797-03	MOTHER	Not Specified	08/25/09 09:05
L0911797-04	NR204	Not Specified	08/25/09 10:00
L0911797-05	NR162	Not Specified	08/25/09 11:00
L0911797-06	UR013	Not Specified	08/25/09 11:00
L0911797-07	NR160	Not Specified	08/25/09 12:00
L0911797-08	ESP01	Not Specified	08/25/09 12:02

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet all of the requirements of NELAC, for all NELAC accredited parameters. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report.

Please see the associated ADEX data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

For additional information, please contact Client Services at 800-624-9220.

Surfactants, MBAS

L0911797-04 has an elevated detection limit due to the dilution required to quantitate the result within the calibration range.

Chlorine, Total Residual

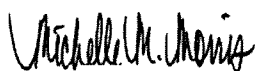
WG377059: A Laboratory Duplicate could not be performed due to insufficient sample volume available for analysis.

Chlorine, Residual Free

WG377060: A Laboratory Duplicate could not be performed due to insufficient sample volume available for analysis.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Title: Technical Director/Representative

Date: 09/01/09

METALS

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-01
Client ID: DENT285
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 07:50
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab										
Potassium, Total	3.4		mg/l	2.5	1	08/27/09 12:45	08/28/09 17:32	EPA 3005A	1,6010B	AI



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-02
Client ID: BLUE UP
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 08:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	ND		mg/l	2.5	1	08/27/09 12:45	08/28/09 17:49	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-03
Client ID: MOTHER
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 09:05
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab										
Potassium, Total	3.7		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:02	EPA 3005A	1,6010B	AI



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-04
Client ID: NR204
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 10:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	8.7		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:06	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-05
Client ID: NR162
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Westborough Lab										
Potassium, Total	7.4		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:11	EPA 3005A	1,6010B	AI



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-06
Client ID: UR013
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	7.2		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:15	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-07
Client ID: NR160
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	4.8		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:19	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-08
Client ID: ESP01
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:02
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
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Total Metals - Westborough Lab

Potassium, Total	ND		mg/l	2.5	1	08/27/09 12:45	08/28/09 18:24	EPA 3005A	1,6010B	AI
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Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Westborough Lab for sample(s): 01-08 Batch: WG377416-1								
Potassium, Total	ND	mg/l	2.5	1	08/27/09 12:45	08/28/09 17:19	1,6010B	AI

Prep Information

Digestion Method: EPA 3005A



Lab Control Sample Analysis

Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01-08 Batch: WG377416-2					
Potassium, Total	100	-	80-120	-	

Matrix Spike Analysis Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377416-4 QC Sample: L0911797-01 Client ID: DENT285									
Potassium, Total	3.4	10	14	106	-	-	75-125	-	20

Lab Duplicate Analysis
Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Total Metals - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377416-3 QC Sample: L0911797-01 Client ID: DENT285					
Potassium, Total	3.4	3.4	mg/l	0	20

INORGANICS & MISCELLANEOUS

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-01
Client ID: DENT285
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 07:50
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	0.400		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:28	30,4500NH3-BH	AT
Surfactants, MBAS	0.22		mg/l	0.05	1	-	08/26/09 19:21	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-02
Client ID: BLUE UP
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 08:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	ND		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:28	30,4500NH3-BH	AT
Surfactants, MBAS	0.05		mg/l	0.05	1	-	08/26/09 19:22	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-03
Client ID: MOTHER
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 09:05
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	ND		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:29	30,4500NH3-BH	AT
Surfactants, MBAS	0.06		mg/l	0.05	1	-	08/26/09 19:22	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-04
Client ID: NR204
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 10:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	0.56		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	20.1		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:30	30,4500NH3-BH	AT
Surfactants, MBAS	8.7		mg/l	0.50	10	-	08/26/09 20:45	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-05
Client ID: NR162
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	0.55		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	13.2		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:31	30,4500NH3-BH	AT
Surfactants, MBAS	0.89		mg/l	0.05	1	-	08/26/09 19:24	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-06
Client ID: UR013
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 11:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	0.62		mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	12.4		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:32	30,4500NH3-BH	AT
Surfactants, MBAS	0.92		mg/l	0.05	1	-	08/26/09 19:25	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-07
Client ID: NR160
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:00
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/28/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	0.598		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:33	30,4500NH3-BH	AT
Surfactants, MBAS	0.05		mg/l	0.05	1	-	08/26/09 20:47	30,5540C	BH



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

SAMPLE RESULTS

Lab ID: L0911797-08
Client ID: ESP01
Sample Location: Not Specified
Matrix: Water

Date Collected: 08/25/09 12:02
Date Received: 08/25/09
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab									
Chlorine, Total Residual	ND		mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
Chlorine, Residual Free	ND		mg/l	0.05	1	-	08/25/09 21:30	30,4500CL-D	BH
Fluoride	ND		mg/l	0.20	1	08/28/09 11:00	08/29/09 11:00	30,4500F-BC	ST
Nitrogen, Ammonia	0.10		mg/l	0.075	1	08/27/09 11:45	08/27/09 17:33	30,4500NH3-BH	AT
Surfactants, MBAS	0.07		mg/l	0.05	1	-	08/26/09 20:48	30,5540C	BH



Project Name: RARE
Project Number: 09080048

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Method Blank Analysis
Batch Quality Control

Parameter	Result Qualifier	Units	RDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377059-1								
Chlorine, Total Residual	ND	mg/l	0.02	1	-	08/25/09 19:30	30,4500CL-D	BH
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377060-1								
Chlorine, Residual Free	ND	mg/l	0.05	1	-		30,4500CL-D	BH
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377218-1								
Surfactants, MBAS	ND	mg/l	0.05	1	-	08/26/09 19:19	30,5540C	BH
General Chemistry - Westborough Lab for sample(s): 01-08 Batch: WG377327-1								
Nitrogen, Ammonia	ND	mg/l	0.075	1	08/27/09 11:45	08/27/09 17:01	30,4500NH3-BH	AT
General Chemistry - Westborough Lab for sample(s): 01-06 Batch: WG377695-1								
Fluoride	ND	mg/l	0.20	1	08/29/09 11:00	08/29/09 11:00	30,4500F-BC	ST
General Chemistry - Westborough Lab for sample(s): 07-08 Batch: WG377696-1								
Fluoride	ND	mg/l	0.20	1	08/28/09 11:00	08/29/09 11:00	30,4500F-BC	ST



Lab Control Sample Analysis Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377059-2					
Chlorine, Total Residual	93	-		-	
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377060-2					
Chlorine, Residual Free	94	-		-	
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377218-2					
Surfactants, MBAS	92	-	65-126	-	
General Chemistry - Westborough Lab Associated sample(s): 01-08 Batch: WG377327-2					
Nitrogen, Ammonia	98	-	80-120	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-06 Batch: WG377695-2					
Fluoride	92	-	78-115	-	
General Chemistry - Westborough Lab Associated sample(s): 07-08 Batch: WG377696-2					
Fluoride	97	-	78-115	-	

Matrix Spike Analysis Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377218-4 QC Sample: L0911797-02 Client ID: BLUE UP									
Surfactants, MBAS	0.05	0.24	0.34	121	-	-	52-157	-	32
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377327-3 QC Sample: L0911437-01 Client ID: MS Sample									
Nitrogen, Ammonia	0.339	4	4.23	97	-	-	80-120	-	20
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG377695-3 QC Sample: L0911797-01 Client ID: DENT285									
Fluoride	ND	1	1.1	106	-	-	69-124	-	13
General Chemistry - Westborough Lab Associated sample(s): 07-08 QC Batch ID: WG377696-3 QC Sample: L0911797-08 Client ID: ESP01									
Fluoride	ND	1	1.0	100	-	-	69-124	-	13

*Is this a
problem the
RPDs aren't
reported?*

Lab Duplicate Analysis Batch Quality Control

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377218-3 QC Sample: L0911797-01 Client ID: DENT285					
Surfactants, MBAS	0.22	0.21	mg/l	5	32
General Chemistry - Westborough Lab Associated sample(s): 01-08 QC Batch ID: WG377327-4 QC Sample: L0911437-01 Client ID: DUP Sample					
Nitrogen, Ammonia	0.339	0.349	mg/l	3	20
General Chemistry - Westborough Lab Associated sample(s): 01-06 QC Batch ID: WG377695-4 QC Sample: L0911797-01 Client ID: DENT285					
Fluoride	ND	ND	mg/l	NC	13
General Chemistry - Westborough Lab Associated sample(s): 07-08 QC Batch ID: WG377696-4 QC Sample: L0911797-08 Client ID: ESP01					
Fluoride	ND	ND	mg/l	NC	13

Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler Custody Seal
A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis
L0911797-01A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-01B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-01C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-01D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-01E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-02A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-02B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-02C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-02D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-02E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-03A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-03B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-03C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-03D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-03E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-04A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-04B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-04C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-04D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-04E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-05A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-05B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-05C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-05D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-05E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-06A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-06B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-06C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-06D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-06E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)

*Hold days indicated by values in parentheses



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
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Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis
L0911797-07A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-07B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-07C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-07D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-07E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)
L0911797-08A	Plastic 1000ml unpreserved	A	6	4.5	Y	Absent	MBAS-5540(2)
L0911797-08B	Plastic 500ml H2SO4 preserved	A	<2	4.5	Y	Absent	NH3-4500(28)
L0911797-08C	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	RFC-4500(1),TRC-4500(1)
L0911797-08D	Plastic 500ml unpreserved	A	6	4.5	Y	Absent	F-4500(28)
L0911797-08E	Plastic 250ml HNO3 preserved	A	<2	4.5	Y	Absent	K-TI(180)

Container Comments

L0911797-01A

L0911797-02A

L0911797-04C

*Hold days indicated by values in parentheses



Project Name: RARE
Project Number: 09080048

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GLOSSARY

Acronyms

- EPA - Environmental Protection Agency.
- LCS - Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD - Laboratory Control Sample Duplicate: Refer to LCS.
- MS - Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD - Matrix Spike Sample Duplicate: Refer to MS.
- NA - Not Applicable.
- NC - Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND - Not detected at the reported detection limit for the sample.
- NI - Not Ignitable.
- RDL - Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than five times (5x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RDL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

Report Format: Data Usability Report



Project Name: RARE
Project Number: 09080048

Lab Number: L0911797
Report Date: 09/01/09

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IIIA, 1997.
- 30 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WPCF. 18th Edition. 1992.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certificate/Approval Program Summary

Last revised August 27, 2009 - Westboro Facility

The following list includes only those analytes/methods for which certification/approval is currently held.
For a complete listing of analytes for the referenced methods, please contact your Alpha Customer Service Representative.

Connecticut Department of Public Health Certificate/Lab ID: PH-0574. **NELAP Accredited Solid Waste/Soil.**

Drinking Water (Inorganic Parameters: Color, pH, Turbidity, Conductivity, Alkalinity, Chloride, Free Residual Chlorine, Fluoride, Calcium Hardness, Sulfate, Nitrate, Nitrite, Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, Zinc, Total Dissolved Solids, Total Organic Carbon, Total Cyanide, Perchlorate. Organic Parameters: Haloacetic Acids, Volatile Organics 524.2, Total Trihalomethanes 524.2, 1,2-Dibromo-3-chloropropane (DBCP), Ethylene Dibromide (EDB).)

Wastewater/Non-Potable Water (Inorganic Parameters: Color, pH, Conductivity, Acidity, Alkalinity, Chloride, Total Residual Chlorine, Fluoride, Total Hardness, Calcium Hardness, Silica, Sulfate, Sulfide, Ammonia, Kjeldahl Nitrogen, Nitrate, Nitrite, O-Phosphate, Total Phosphorus, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Strontium, Thallium, Tin, Titanium, Vanadium, Zinc, Total Residue (Solids), Total Dissolved Solids, Total Suspended Solids (non-filterable), BOD, CBOD, COD, TOC, Total Cyanide, Phenolics, Foaming Agents (MBAS), Bromide, Oil and Grease. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, 2,4-D, 2,4,5-T, 2,4,5-TP (Silvex), Acid Extractables (Phenols), Benzidines, Phthalate Esters, Nitrosamines, Nitroaromatics & Isophorone, Polynuclear Aromatic Hydrocarbons, Haloethers, Chlorinated Hydrocarbons, Volatile Organics.)

Solid Waste/Soil (Inorganic Parameters: Lead in Paint, pH, Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Hexavalent Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Tin, Vanadium, Zinc, Total Cyanide, Ignitability, Phenolics, Corrosivity, TCLP Leach (1311), Reactivity. Organic Parameters: PCBs, Organochlorine Pesticides, Technical Chlordane, Toxaphene, Extractable Petroleum Hydrocarbons (ETPH), Dicamba, 2,4-D, 2,4,5-T, 2,4,5-TP (Silvex), Volatile Organics, Acid Extractables (Phenols), 3,3'-Dichlorobenzidine, Phthalates, Nitrosamines, Nitroaromatics & Cyclic Ketones, PAHs, Haloethers, Chlorinated Hydrocarbons.)

Maine Department of Human Services Certificate/Lab ID: 2009024.

Drinking Water (Inorganic Parameters: SM9215B, 9221E, 9222B, 9222D, 9223B, EPA 180.1, 300.0, 353.2, SM2130B, 2320B, 4500Cl-D, 4500CN-C, 4500CN-E, 4500F-C, 4500H+B, 4500NO3-F, EPA 200.7, EPA 200.8, 245.1. Organic Parameters: 504.1, 524.2, SM 6251B.)

Wastewater/Non-Potable Water (Inorganic Parameters: EPA 120.1, 1664A, 350.1, 351.1, 353.2, 410.4, 420.1, Lachat 10-107-06-1-B, SM2320B, 2340B, 2510B, 2540C, 2540D, 426C, 4500Cl-D, 4500Cl-E, 4500CN-C, 4500CN-E, 4500F-B, 4500F-C, 4500H+B, 4500Norg-B, 4500Norg-C, 4500NH3-B, 4500NH3-G, 4500NH3-H, 4500NO3-F, 4500P-B.5, 4500P-E, 5210B, 5220D, 5310C, EPA 200.7, 200.8, 245.1. Organic Parameters: 608, 624.)

Massachusetts Department of Environmental Protection Certificate/Lab ID: M-MA086.

Drinking Water

Inorganic Parameters: (EPA 200.8 for: Sb,As,Ba,Be,Cd,Cr,Cu,Pb,Ni,Se,Tl)

(EPA 200.7 for: Ba,Be,Ca,Cd,Cr,Cu,Na,Ni) 245.1, (300.0 for: Nitrate-N, Nitrite-N, Fluoride, Sulfate)

353.2 for: Nitrate-N, Nitrite-N; SM4500NO3-F, 4500F-C, 4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, 2320B, SM2540C, SM4500H-B.

Organic Parameters: (EPA 524.2 for: Trihalomethanes, Volatile Organics)

(504.1 for: 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane), SM6251B, 314.0.

Non-Potable Water

Inorganic Parameters:, (EPA 200.8 for: Al,Sb,As,Be,Cd,Cr,Cu,Pb,Mn,Ni,Se,Ag,Tl,Zn)

(EPA 200.7 for: Al,Sb,As,Be,Cd,Cr,Co,Cu,Fe,Pb,Mn,Mo,Ni,Se,Ag,Sr,Tl,Ti,V,Zn,Ca,Mg,Na,K)

245.1, SM4500H,B, EPA 120.1, SM2510B, 2540C, 2540B, 2320B, 4500CL-E, 4500F-BC, 426C, SM4500NH3-BH, (EPA 350.1 for: Ammonia-N), LACHAT 10-107-06-1-B for Nitrate-N, SM4500NO3-F, 353.2 for Nitrate-N, SM4500NH3-B,C-Titr, SM4500NH3-BC-NES, EPA 351.1, SM4500P-E, 4500P-B,E, 5220D, EPA 410.4, SM 5210B, 5310C, 4500CN-CE, 2540D, 4500CL-D, EPA 1664, SM14 510AC, EPA 420.1

Organic Parameters: (EPA 624 for Volatile Halocarbons, Volatile Aromatics)

(608 for: Chlordane, Aldrin, Dieldrin, DDD, DDE, DDT, Heptachlor, Heptachlor Epoxide, PCB-Water)

600/4-81-045-PCB-Oil

Drinking Water

Microbiology Parameters: SM9215B; MF-SM9222B; ENZ. SUB. SM9223; EC-SM9221E; MF-SM9222D;

New Hampshire Department of Environmental Services Certificate/Lab ID: 200307. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM6215B, 9222B, 9223B Colilert, EPA 200.7, 200.8, 245.2, 120.1, 300.0, 314.0, SM4500CN-E, 4500H+B, 4500NO3-F, 2320B, 2510B, 2540C, 4500F-C, 5310C, 2120B, EPA 331.0. *Organic Parameters:* 504.1, 524.2, SM6251B.)

Non-Potable Water (Inorganic Parameters: SM9222D, 9221B, 9222B, 9221E-EC, EPA 200.7, 200.8, 245.1, 245.2, SW-846 6010B, 6020, 7196A, 7470A, SM3500-CR-D, EPA 120.1, 300.0, 350.1, 351.1, 353.2, 420.1, 1664A, SW-846 9010, 9030, 9040B, SM426C, SM2310B, 2540B, 2540D, 4500H+B, 4500NH3-H, 4500NH3-E, 4500NO2-B, 4500P-E, 4500-S2-D, 5210B, 2320B, 2540C, 4500F-C, 5310C, 5540C, LACHAT 10-117-07-1-B, LACHAT 10-107-06-1-B, LACHAT 10-107-04-1-C, LACHAT 10-107-04-1-J, LACHAT 10-117-07-1-A, SM4500CL-E, LACHAT 10-204-00-1-A, LACHAT 10-107-06-2-D. *Organic Parameters:* SW-846 3005A, 3015A, 3510C, 5030B, 8021B, 8260B, 8270C, 8330, EPA 624, 625, 608, SW-846 8082, 8081A.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 6010B, 7196A, 7471A, 7.3.3.2, 7.3.4.2, 1010, 1030, 9010, 9012A, 9014, 9030B, 9040, 9045C, 9050C, 1311, 3005A, 3050B, 3051A. *Organic Parameters:* SW-846 3540C, 3545, 3580A, 5030B, 5035, 8021B, 8260B, 8270C, 8330, 8151A, 8082, 8081A.)

New Jersey Department of Environmental Protection Certificate/Lab ID: MA935. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9222B, 9221E, 9223B, 9215B, 4500NO3-F, 4500F-C, EPA 300.0, 200.7, 2540C, 2320B, 314.0, SM2120B, 2510B, 5310C, SM4500H-B, EPA 200.8, 245.2. *Organic Parameters:* 504.1, SM6251B, 524.2.)

Non-Potable Water (Inorganic Parameters: SM5210B, EPA 410.4, SM5220D, 4500CI-D, EPA 300.0, SM2120B, SM4500F-BC, EPA 200.7, 351.1, LACHAT 10-107-06-2-D, EPA 353.2, SM4500NO3-F, 4500NO2-B, EPA 1664A, SM5310B, C or D, 4500-PE, EPA 420.1, SM4500P-B5+E, 2540B, 2540C, 2540D, EPA 120.1, SM2510B, SM15 426C, SM9221CE, 9222D, 9221B, 9222B, 9215B, 2310B, 2320B, 4500NH3-H, 4500-S D, EPA 350.1, SM5210B, SW-846 3015, 6020, 7470A, 5540C, 4500H-B, EPA 200.8, SM3500Cr-D, EPA 245.1, 245.2, SW-846 9040B, 3005A, EPA 6010B, 7196A, SW-846 9010B, 9030B. *Organic Parameters:* SW-846 8260B, 8270C, 3510C, EPA 608, 624, 625, SW-846 5030B, 8021B, 8081A, 8082, 8151A, 8330, NJ OQA-QAM-025 Rev.7.)

Solid & Chemical Materials (Inorganic Parameters: SW-846 9040B, 3005A, 6010B, 7196A, 5030B, 9010B, 9030B, 1030, 1311, 3050B, 3051, 7471A, 9014, 9012A, 9045C, 9050A, 9065. *Organic Parameters:* SW-846 8021B, 8081A, 8082, 8151A, 8330, 8260B, 8270C, 1311, 1312, 3540C, 3545, 3550B, 3580A, 5035L, 5035H, NJ OQA-QAM-025 Rev.7.)

New York Department of Health Certificate/Lab ID: 11148. NELAP Accredited.

Drinking Water (Inorganic Parameters: SM9223B, 9222B, 8215B, EPA 200.8, 200.7, 245.2, SM5310C, EPA 314.0, SM2320B, EPA 300.0, SM2120B, 4500CN-E, 4500F-C, 4500H-B, 4500NO3-F, 2540C, EPA 120.1, SM 2510B. *Organic Parameters:* EPA 524.2, 504.1.)

Non-Potable Water (Inorganic Parameters: SM9221E, 9222D, 9221B, 9222B, 9215B, 5210B, EPA 410.4, SM5220D, 2310B-4a, 2320B, EPA 200.7, 300.0, LACHAT 10-117-07-1A or B, SM4500CI-E, 4500F-C, SM15 426C, EPA 350.1, LACHAT 10-107-06-1-B, SM4500NH3-H, EPA 351.1, LACHAT 10-107-06-2, EPA 353.2, LACHAT 10-107-041-C, SM4500-NO30F, 4500-NO2-B, 4500P-E, 2540C, 2540B, 2540D, EPA 200.8, EPA 6010B, 6020, EPA 7196A, SM3500Cr-D, EPA 245.1, 245.2, 7470A, SM2120B, SM4500-CN-E LACHAT 10-204-00-1-A, EPA 9040B, SM4500-HB, EPA 1664A, SM5310C, EPA 420.1, SM14 510C, EPA 120.1, SM2510B, SM4500S-D, SM5540C, EPA 3005A, 3015. *Organic Parameters:* EPA 624, 8260B, 8270C, 625, 608, 8081A, 8151A, 8330, 8082, 8021B, EPA 3510C, 5030B, 9010B, 9030B.)

Solid & Hazardous Waste (Inorganic Parameters: EPA 9040B, 9045C, 1010, 1030, SW-846 Ch 7 Sec 7.3, EPA 6010B, 7196A, 7471A, 9012A, 9014, 9040B, 9045C, 9065, 9050, EPA 1311, 3005A, 3050B, 9010B, 9030B. *Organic Parameters:* EPA 8260B, 8270C, 8081A, 8151A, 8330, 8082, 8021B, 3540C, 3545, 3580, 5030B, 5035.)

Pennsylvania Department of Environmental Protection Certificate/Lab ID : 68-03671. NELAP Accredited.

Non-Potable Water (Organic Parameters: EPA 3510C, 625, 608, 8081A, 8082, 8151A, 8270C, 8330)

Solid & Hazardous Waste (Inorganic Parameters: EPA 1010, 1030, 1311, 3050B, 3051, 6010B, EPA 7.3.3.2, EPA 7.3.4.2, 7196A, 7471A, 9010B, 9012A, 9014, 9040B, 9045C, 9050, 9065. *Organic Parameters:* 3540C, 3545, 3580A, 5035, 8021B, 8081A, 8082, 8151A, 8260B, 8270C, 8330)

Rhode Island Department of Health Certificate/Lab ID: LAO00065. NELAP Accredited via NY-DOH.

Refer to MA-DEP Certificate for Potable and Non-Potable Water.

Refer to NY-DOH Certificate for Potable and Non-Potable Water.

Utah Department of Health Certificate/Lab ID: AAMA. NELAP Accredited.

Non-Potable Water (Inorganic Parameters: Chloride EPA 300.0)

Non-NELAC Approved Analytes

The following analytes are considered non-NELAC certifiable parameters: 8260B: Freon-113, Diisopropyl Ether, 8330A: PETN; Picric Acid; Nitroglycerine; 2,6-DANT; 2,4-DANT)



REGION 1

CHAIN OF CUSTODY RECORD

Alpha

Page 36 of 36



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

April 26, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10040019
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Emily Bouthiette

Date Samples Received by the Laboratory: 04/21/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Quality Assurance Officer

Water Microbiology Laboratory Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
- - - = Negative control
SP = Spiked Sample
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ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
30Park	AB04169	04/21/10 12:25 pm	04/21/10 1:30 pm	E. Coli Defined Substrate	1741	4	
91Mys	AB04157	04/21/10 8:00 am	04/21/10 1:30 pm	E. Coli Defined Substrate	152	4	
AHS	AB04160	04/21/10 9:05 am	04/21/10 1:30 pm	E. Coli Defined Substrate	666	4	
Grove01	AB04162	04/21/10 9:40 am	04/21/10 1:30 pm	E. Coli Defined Substrate	4480	4	
GroveS	AB04163	04/21/10 9:45 am	04/21/10 1:30 pm	E. Coli Defined Substrate	744	4	
MBike	AB04159	04/21/10 8:50 am	04/21/10 1:30 pm	E. Coli Defined Substrate	268	4	
MillB	AB04158	04/21/10 8:10 am	04/21/10 1:30 pm	E. Coli Defined Substrate	395	4	
Quinn2	AB04164	04/21/10 10:30 am	04/21/10 1:30 pm	E. Coli Defined Substrate	ND	4	
RyderE	AB04167	04/21/10 11:20 am	04/21/10 1:30 pm	E. Coli Defined Substrate	271	4	
RyderW	AB04168	04/21/10 11:30 am	04/21/10 1:30 pm	E. Coli Defined Substrate	30	4	
RyMill	AB04165	04/21/10 11:05 am	04/21/10 1:30 pm	E. Coli Defined Substrate	1302	4	
RyMill2	AB04166	04/21/10 11:10 am	04/21/10 1:30 pm	E. Coli Defined Substrate	ND	4	
UR020	AB04161	04/21/10 9:05 am	04/21/10 1:30 pm	E. Coli Defined Substrate	1549	4	

Number of Samples: 13



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

April 26, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10040019
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Emily Bouthiette

Date Samples Received by the Laboratory: 04/21/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Quality Assurance Officer

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
30Park	AB04169	04/21/10 12:25 pm	04/21/10 1:30 pm	Enterococcus in Water	8164	10	
91Mys	AB04157	04/21/10 8:00 am	04/21/10 1:30 pm	Enterococcus in Water	41	10	
AHS	AB04160	04/21/10 9:05 am	04/21/10 1:30 pm	Enterococcus in Water	213	10	
Grove01	AB04162	04/21/10 9:40 am	04/21/10 1:30 pm	Enterococcus in Water	529	10	
GroveS	AB04163	04/21/10 9:45 am	04/21/10 1:30 pm	Enterococcus in Water	7701	10	
MBike	AB04159	04/21/10 8:50 am	04/21/10 1:30 pm	Enterococcus in Water	233	10	
MillB	AB04158	04/21/10 8:10 am	04/21/10 1:30 pm	Enterococcus in Water	52	10	
Quinn2	AB04164	04/21/10 10:30 am	04/21/10 1:30 pm	Enterococcus in Water	ND	10	
RyderE	AB04167	04/21/10 11:20 am	04/21/10 1:30 pm	Enterococcus in Water	336	10	
RyderW	AB04168	04/21/10 11:30 am	04/21/10 1:30 pm	Enterococcus in Water	20	10	
RyMill	AB04165	04/21/10 11:05 am	04/21/10 1:30 pm	Enterococcus in Water	404	10	
RyMill2	AB04166	04/21/10 11:10 am	04/21/10 1:30 pm	Enterococcus in Water	ND	10	
UR020	AB04161	04/21/10 9:05 am	04/21/10 1:30 pm	Enterococcus in Water	173	10	

Number of Samples: 13



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

August 31, 2009

Todd Borci - SEW
US EPA New England Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 09080048
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Emily Bouthiette

Date Samples Received by the Laboratory: 08/25/2009

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Quality Assurance Officer

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P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Coll	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
Blue Up	AA97412	08/25/09 8:00 an	08/25/09 1:45 pm	Enterococcus in Water	64	10	
Dent 285	AA97411	08/25/09 7:50 an	08/25/09 1:45 pm	Enterococcus in Water	3683	10	
Esp01	AA97418	08/25/09 12:02 p	08/25/09 1:45 pm	Enterococcus in Water	58	10	
Mother	AA97413	08/25/09 9:05 an	08/25/09 1:45 pm	Enterococcus in Water	56	10	
NR160	AA97417	08/25/09 12:00 p	08/25/09 1:45 pm	Enterococcus in Water	149	10	
NR162	AA97415	08/25/09 11:00 ai	08/25/09 1:45 pm	Enterococcus in Water	5226	10	
NR204	AA97414	08/25/09 10:00 ai	08/25/09 1:45 pm	Enterococcus in Water	>48392	10	J
UR013	AA97416	08/25/09 11:00 ai	08/25/09 1:45 pm	Enterococcus in Water	5510	10	

Number of Samples: 8



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

October 18, 2010

Todd Borci (OES04-4)
US EPA New England Region 1

Project Number: 10100019
Project: RARE Stormwater
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 10/13/2010

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory Data Qualifier Codes

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
D Launch	AB11528	10/13/10 8:15 am	10/13/10 1:45 pm	Enterococcus in Water	860	10	
MH Winslo	AB11536	10/13/10 11:11 am	10/13/10 1:45 pm	Enterococcus in Water	118	10	
MH Winsta	AB11537	10/13/10 11:28 am	10/13/10 1:45 pm	Enterococcus in Water	98	10	
MH19	AB11530	10/13/10 8:38 am	10/13/10 1:45 pm	Enterococcus in Water	24196	10	
MH2203	AB11535	10/13/10 10:55 am	10/13/10 1:45 pm	Enterococcus in Water	5475	10	
MH2336	AB11534	10/13/10 10:38 am	10/13/10 1:45 pm	Enterococcus in Water	2489	10	
MH29A	AB11533	10/13/10 9:55 am	10/13/10 1:45 pm	Enterococcus in Water	41	10	
MH32	AB11531	10/13/10 9:10 am	10/13/10 1:45 pm	Enterococcus in Water	10	10	
MH48	AB11532	10/13/10 9:30 am	10/13/10 1:45 pm	Enterococcus in Water	ND	10	
UR038	AB11529	10/13/10 8:15 am	10/13/10 1:45 pm	Enterococcus in Water	723	10	

Number of Samples: 10



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

August 31, 2009

Todd Borci - SEW
US EPA New England Region 1
One Congress Street
Boston, MA 02114 - 2023

Project Number: 09080048
Project: RARE Stormwater
Analysis: E. Coli Defined Substrate
Analyst: Emily Bouthiette

Date Samples Received by the Laboratory: 08/25/2009

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

David F. McDonald
Biology Quality Assurance Officer

Water Microbiology Laboratory Data Qualifier Codes

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

RARE Stormwater

E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Coll	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
Blue Up	AA97412	08/25/09 8:00 an	08/25/09 1:45 pm	E. Coli Defined Substrate	226	4	
Dent 285	AA97411	08/25/09 7:50 an	08/25/09 1:45 pm	E. Coli Defined Substrate	33000	4	
Esp01	AA97418	08/25/09 12:02 p	08/25/09 1:45 pm	E. Coli Defined Substrate	241	4	
Mother	AA97413	08/25/09 9:05 an	08/25/09 1:45 pm	E. Coli Defined Substrate	129	4	
NR160	AA97417	08/25/09 12:00 p	08/25/09 1:45 pm	E. Coli Defined Substrate	1741	4	
NR162	AA97415	08/25/09 11:00 ai	08/25/09 1:45 pm	E. Coli Defined Substrate	198630	4	
NR204	AA97414	08/25/09 10:00 ai	08/25/09 1:45 pm	E. Coli Defined Substrate	>241960	4	J
UR013	AA97416	08/25/09 11:00 ai	08/25/09 1:45 pm	E. Coli Defined Substrate	241960	4	

Number of Samples: 8

RARE Stormwater Outfall Inspection & Sampling Summary

Location				Outfall		Inspection											
Date	Town	Site Name	Time	Pipe Mat.	Dia. (in)	Est. Flow (gpm)	Odor	Color	Turbidity	Floatables	E.coli (MPN/100m l)	Enterococci (MPN/100ml)	Surfact. (mg/l)			Alpha	
													Alpha	Field	DR-850		
7/29/09	Revere	SD08A	9:45	NS	NS	15-20	ht sewage c	NS	NS	None	NA	10	NA	0.60	NA	NA	
7/29/09	Revere	SD10A	10:00	plastic	12"	3	ht sewage c	NS	NS	gnificant foa	NA	20	NA	0.25	NA	NA	
7/29/09	Revere	WashN01	10:10	concrete	24		none	NS	NS	None	NA	2282	NA	0.75	NA	NA	
7/29/09	Revere	SalesN	10:15	NS	NS		none	NS	NS	None	NA	295	NA	0.75	NA	NA	
7/29/09	Revere	SalesE	10:25	NS	24"+		none	tan	y turbid; clc	None	NA	95	NA	0.70	NA	NA	
7/29/09	Revere	Green01	11:11	NS	NS		slight musty	None	cloudy	None	NA	14136	NA	0.70	NA	NA	
7/29/09	Revere	UR006	11:11	NS	NS		slight musty	None	cloudy	None	NA	14136	NA	NA	NA	NA	
7/29/09	Revere	Wonder01	11:50	CM	4'		None	None	none	None	NA	185	NA	0.40	NA	NA	
7/29/09	Revere	STRACC1	12:05	NS	NS		None	NS	NS	NS	NA	605	NA	0.40	NA	NA	

[illegible]

			Coordinates				Additional Location Information	YSI Meter			Weather			
ride	Potassium (mg/L)							Salinity	Temp	Cond uctivit	Rain Gauge	24hr s	48hrs	Wet/Dry ?
DR-850	Alpha	Field	GPS North(+)	GPS West (-)	Comments		ppt	C	uS	Location	inches	inches		
NA	NA	NA	42.39960591	-70.99828284	slight gray plaque; lot	downstream - pipe on	1.8	18.1	3447	Boston-Logan	0	0	Dry	
NA	NA	NA	42.40075317	-70.99738614	orange floc in pipe an	Site at intersection on	1.1	20.4	1982	Boston-Logan	0	0	Dry	
NA	NA	NA	42.399852	-70.99260269	sample taken from ab	NE back corner of Sh	4.3	20.4	7.6	Boston-Logan	0	0	Dry	
NA	NA	NA	42.400002	-70.991803	slight flow in channel	Upstream of WashN0	4.5	21.7	8.14	Boston-Logan	0	0	Dry	
NA	NA	NA	42.399999	-70.991803	Pipe enters Sales from	East just South of fer	5.4	15.4	9.6	Boston-Logan	0	0	Dry	
NA	NA	NA	42.40269115	-71.00375656	Cloudy; algae on rock	Sampled over pedest	1.7	18.1	3271	Boston-Logan	0	0	Dry	
NA	NA	NA	42.40269115	-71.00375656	Duplicate of Green01		na	na	na	Boston-Logan	0	0	Dry	
NA	NA	NA	42.41458312	-70.9947105	Lots of film on surface	Very back of corner o	1.1	23	22.38	Boston-Logan	0	0	Dry	
NA	NA	NA	42.41699849	-70.99015595	Used reach, lots of fra	End of Agawam St; of	1.4	21.2	2737	Boston-Logan	0	0	Dry	



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 06, 2011

Todd Borci - Mail Code OES04-4
US EPA New England R1

Project Number: 11060038
Project: Revere/Chelsea/Lexington CSI
Analysis: HPLC/MS/MS Source Tracking Analysis
Analyst: Peter Philbrook *PP 7-6-2011*

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-LCMS_STA.0.

The SOP is based on an EPA Regional Analytical Method developed at the EPA New England Laboratory.

Date Samples Received by the Laboratory: 06/22/2011

Data were reviewed in accordance with the internal verification procedures described in the EPA New England OEME Chemistry QA Plan.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Report may contain multiple sections and each section will be numbered independently.

If you have any questions please call me at 617-918-8340

Sincerely,

Daniel N Boudreau 7/7/11

Daniel N Boudreau
Chemistry Team Leader

DATA QUALIFIERS

RL	Reporting limit
J	Estimated value
E	Estimated value exceeds the calibration range
L	Estimated value is below the calibration range
B	Analyte is associated with the lab blank or trip blank contamination.
R	No recovery was calculated since the analyte concentration is greater than four times the spike level.
ND	Not Detected above Reporting limit
NA	Not Applicable due to high sample dilutions or sample interferences
ME	Matrix Effect - Sample matrix was responsible for either enhanced or suppressed ionization within the electrospray ionization probe

NARRATIVE

Aqueous samples (500mL) were extracted using a solid phase extraction (SPE) technique, following EPA Method 1694, in which samples were passed through a cartridge containing a solid sorbent material which pre-concentrates the target compounds onto the sorbent. The target compounds (TCs) were then eluted off the sorbent material using methanol. The resulting eluant is concentrated to dryness and re-constituted to a final volume of 1 mL with 20/80 Methanol/Water.

A 5uL aliquot of the sample extract was injected into a High Performance Liquid Chromatograph (HPLC), and the TCs were separated chromatographically using a C8 HPLC column running a methanol / water gradient. The ionization mode used was electrospray with the polarity operating in the positive mode. The TCs were detected using a Waters Acquity TQD Tandem Quadrupole Mass Spectrometer. The tandem quadrupole is used to perform multiple reaction monitoring (MRM) where the precursor ion of interest is fragmented to product ion(s).

Quantitation was performed by the internal standard calibration method using isotopically labeled analogues. Sulfamethazine $^{13}\text{C}_6$ and Primidone d_5 were used as a surrogate compounds to monitor extraction efficiency.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI
HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mill 2A
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18938
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	6.1	2.0	B
103-90-2	Acetaminophen	4.2	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	27	4.0	
298-46-4	Carbamazepine	17	0.4	
486-56-6	Cotinine	19	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	74	23 - 181
Sulfamethazine 13C6	44	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mill 2
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18939
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	16	2.0	
103-90-2	Acetaminophen	3.3	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	7.7	4.0	B
298-46-4	Carbamazepine	10	0.4	
486-56-6	Cotinine	6.5	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	72	23 - 181
Sulfamethazine 13C6	33	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mill Cr 1
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18940
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	42	2.0	
103-90-2	Acetaminophen	170	4.0	
29122-68-7	Atenolol	25	2.0	
58-08-2	Caffeine	340	8.0	
298-46-4	Carbamazepine	3.6	0.4	
486-56-6	Cotinine	14	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	89	23 - 181
Sulfamethazine 13C6	41	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI
HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Belle Is 1
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18941
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	10	2.0	B
103-90-2	Acetaminophen	ND	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	3.8	4.0	B,L
298-46-4	Carbamazepine	0.74	0.4	
486-56-6	Cotinine	6.2	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	72	23 - 181
Sulfamethazine 13C6	45	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Belle Is 2
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 440 mL

Lab Sample ID: AB18942
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	12	2.2	B
103-90-2	Acetaminophen	21	2.2	
29122-68-7	Atenolol	3.3	2.2	
58-08-2	Caffeine	15	4.4	B
298-46-4	Carbamazepine	0.93	0.4	
486-56-6	Cotinine	5.2	0.4	
57-68-1	Sulfamethazine	0.73	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	94	23 - 181
Sulfamethazine 13C6	38	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI
HPLC/MS/MS Source Tracking Analysis

Client Sample ID: MWRA 205
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18943
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1 & 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	670	20.0	
103-90-2	Acetaminophen	2800	20.0	
29122-68-7	Atenolol	110	2.0	
58-08-2	Caffeine	3000	40.0	
298-46-4	Carbamazepine	14	0.4	
486-56-6	Cotinine	73	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	83	23 - 181
Sulfamethazine 13C6	93	15 - 132

Comments: Urobilin estimated concentration = 450 ng/L

10X dilution was required to quantitate certain analytes.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Is End 03A
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 425 mL

Lab Sample ID: AB18944
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	540	23.6	
103-90-2	Acetaminophen	1500	23.6	
29122-68-7	Atenolol	57	23.6	
58-08-2	Caffeine	1200	47.2	
298-46-4	Carbamazepine	28	4.7	
486-56-6	Cotinine	48	4.7	
57-68-1	Sulfamethazine	8.2	4.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	85	23 - 181
Sulfamethazine 13C6	64	15 - 132

Comments: Urobilin estimated concentration = 260 ng/L

10X dilution was required to quantitate target compounds.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Is End 03Z
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18945
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	150	20.0	
103-90-2	Acetaminophen	460	20.0	
29122-68-7	Atenolol	21	20.0	
58-08-2	Caffeine	410	40.0	
298-46-4	Carbamazepine	7.2	4.0	
486-56-6	Cotinine	14	4.0	
57-68-1	Sulfamethazine	6.6	4.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	77	23 - 181
Sulfamethazine 13C6	47	15 - 132

Comments: Urobilin estimated concentration = 58 ng/L

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Vine 01
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18946
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1 & 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	240	20.0	
103-90-2	Acetaminophen	440	20.0	
29122-68-7	Atenolol	26	2.0	
58-08-2	Caffeine	1200	40.0	
298-46-4	Carbamazepine	4.8	0.4	
486-56-6	Cotinine	8.0	0.4	
57-68-1	Sulfamethazine	1.3	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	81	23 - 181
Sulfamethazine 13C6	82	15 - 132

Comments: Urobilin estimated concentration = 290 ng/L

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

Laboratory Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: N/A
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	3.9	2.0	
103-90-2	Acetaminophen	ND	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	4.9	4.0	
298-46-4	Carbamazepine	ND	0.4	
486-56-6	Cotinine	ND	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds

Recoveries (%)

QC Ranges

Sulfamethazine 13C3

104

Primidone d5

109

Comments: Caffeine and 1,7-Dimethylxanthine were detected in the blank near the reporting limit. Results in samples will be qualified as "B" if the concentration is < 3X the value found in the blank.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

MATRIX SPIKE RECOVERY

Revere/Chelsea/Lexington CSI

Sample ID: AB18942

PARAMETER	SPIKE ADDED ng/L	SAMPLE CONCENTRATION ng/L	MS CONCENTRATION ng/L	MS % REC	QC LIMITS (% REC)
1,7-Dimethylxanthine	136	12	168	115	7 - 120
Acetaminophen	136	21	165	106	1 - 120
Atenolol	136	3.3	122	87.3	40 - 146
Caffeine	273	15	189	63.7	12 - 138
Carbamazepine	27	0.93	27	95.5	27 - 144
Cotinine	27	5.2	30	90.8	48 - 131
Sulfamethazine	27	0.73	11	37.6	30 - 130

LABORATORY DUPLICATE RESULTS

Revere/Chelsea/Lexington CSI

Sample ID: AB18944

PARAMETER	SAMPLE RESULT ng/L	SAMPLE DUPLICATE RESULT ng/L	PRECISION RPD %	QC LIMITS
1,7-Dimethylxanthine	540	410	27.4	50
Acetaminophen	1500	1600	6.45	50
Atenolol	57	56	1.77	50
Caffeine	1200	1000	18.2	50
Carbamazepine	28	20	33.3	50
Cotinine	48	45	6.45	50
Sulfamethazine	8.2	8.0	2.47	50

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

LABORATORY FORTIFIED BLANK (LFB) RECOVERY

Revere/Chelsea/Lexington CSI

COMPOUND	SPIKE ADDED ng/L	LFB CONCENTRATION ng/L	LFB RECOVERY %	QC LIMITS (% REC)
1,7-Dimethylxanthine	120	115	95.8	14 - 155
Acetaminophen	120	112	93.3	43 - 129
Atenolol	120	106	88.3	45 - 136
Caffeine	240	195	81.2	57 - 132
Carbamazepine	24	24	100	39 - 136
Cotinine	24	23	95.8	60 - 127
Sulfamethazine	24	15	62.5	30 - 130

Comments: Urobilin recovery was 16%



Water Compliance Inspection Report

Transaction Code		NPDES		yr/mo/day		Inspection Type		Inspector		Fac Type	
1	W	2	5	3	MA	4	04	11	05	17	11
Remarks											
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Name and Location of Facility Inspected (For industrial users discharging to POTW; also include POTW name and NPDES permit number) City of Revere, Massachusetts 281 Broadway Revere, MA 02151	Entry Time/Date 0900 7/29/09	Permit Effective Date May 2003
	Exit Time/Date 1230 7/29/09	Permit Expiration Date May 2008

Other Facility Data (e.g., SIC NAICS, and other descriptive information)

Frank Strangi ; City Planner
781-286-8183

Contacted

☐ Yes ☐ No

Permit	Self-Monitoring Program	Pretreatment	MS4
Records/Reports	Compliance Schedules	Pollution Prevention	
Facility Site Review	Laboratory	<input checked="" type="checkbox"/> Storm Water	
Effluent/Receiving Waters	Operations & Maintenance	Combined Sewer Overflow	
Flow Measurement	Sludge Handling/Disposal	Sanitary Sewer Overflow	

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
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Date _____

Ladd Brown

U.S. EPA RI 617-918-1358

8/14/09

Date _____



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 11 July 2011

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
City of Chelsea, MA

From: Todd Borci

To: File

On Wednesday, 22 June 2011, EPA inspector Todd Borci conducted a Compliance Sampling Inspection (CSI) of the City of Revere, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4"). EPA collected water quality samples from two stormwater outfalls located along the north bank of Belle Isle Inlet near the southern terminus of Belle Isle Avenue.

At approximately 0945 hours EPA sampled an approximately 8-inch diameter outfall (sample id "BelleIs1") located approximately 100 feet southwest of the southern terminus of Belle Isle Avenue. Access was gained by a small path through the phragmites. This outfall is corrugated metal pipe in construction with a tide flap. EPA noted flow of approximately 2 gallons per minute, with some suds on the surface of the plunge pool below the outfall. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA processed a surface water sample collected at the location. Field kits indicated detectable levels of ammonia (0.4 mg/l) and surfactants (1.5 mg/l) in the sample. EPA notes the elevated surfactant level was likely due in part to the elevated salinity (10.85 parts per thousand) of the water discharging from the outfall. EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where sample results equal to or greater than these concentrations may be indicative of illicit discharges. A sample was collected and sent back to the EPA laboratory to be analyzed for e. coli and enterococcus bacteria, and selected pharmaceutical compounds.

At approximately 0950 EPA sampled a second outfall ("BelleIs2") approximately 50 west of the "BelleIs1" location. The outfall was an approximately 24-inch concrete pipe that was half submerged at the time of sampling. A steady flow with a slight oily sheen on the surface was observed discharging from the outfall. Sampling was conducted on an outgoing tide, as low tide was anticipated to occur at approximately 1049 hours. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA processed a surface water sample collected at the location. Field kits indicated detectable levels of ammonia (0.1 mg/l), and elevated levels of surfactants (2.0 mg/l) in the sample, although EPA notes this reading is likely due at least in part to the salinity of the brackish water during sampling, which was measured at

29.46 parts per thousand. A sample was collected and sent back to the EPA laboratory for analyses for e. coli and enterococcus bacteria, and selected pharmaceutical compounds.

Once received from EPA laboratory, the analytical data for this sampling effort will be attached to this report.

Inspection ended at 1000 hours. EPA has been and will continue to be in contact with the City of Revere and its consultants for follow-up as appropriate.



Photo 1: 6/22/11 0945 View of “BelleIs1” sample location. Note suds on water surface in plung pool.



Photo 2: 6/22/11 0950 View of “BelleIs2” sample location approximately 50 feet west of “BelleIs1”. Faint oil sheen can be seen discharging from pipe along right center of photo.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 17 November 2009

Subj: NPDES Inspection
Municipal Separate Storm Sewer System (MS4)
City of Revere, MA

From: Todd Borci

To: File

On Tuesday, 17 November 2009, EPA inspector Todd Borci conducted an unannounced Inspection (CSI) of the City of Revere, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4"). Outfalls to Sales Creek in the southeastern portion of the City were the focus of this inspection.

EPA observed an outfall just north of the Shaw's Market parking lot (east side) on the northern side of Route 145. EPA has referred to this as the Washburn Avenue outfall. The outfall is located in a concrete headwall and is typically under water. EPA was able to observe a cloudy tan discharge coming from the outfall pipe. Small pieces of floatable material could be observed as well. No obvious odor was evident.

EPA then observed the upper portion of Sales Creek accessed by walking north from the Washburn Ave. outfall along the eastern side of the stream. Sales Creek comes from the north beneath a chain-link fence. An unnamed outfall (approximately 24-inch concrete) enters the stream from the east. No apparent flow was observed. Several small fish were visible in the stream in this area. A significant amount of trash exists throughout this area.

The western branch of Sales Creek near the end of Green Street was observed next. On July 29, 2009, EPA sampling at this location detected elevated levels of enterococcus bacteria (14,136 cfu/100 ml), surfactants (0.7 mg/l), and ammonia (4.0 mg/l). The City has not consistently sampled this location due to "stagnant" conditions. While flow appeared stagnant at the outfall opening (coming from beneath Route 1A North), there was clearly flow (10 gallons per minute) just downstream at a small pedestrian bridge. It appears that a film of dust/debris on the water surface gives the appearance of stagnant water, but that a sample should be able to be obtained from this location on a regular basis.



Photo 1: 11/17/09 View of Washburn Avenue outfall. Cloudy tan discharge plume visible.



Photo 2: 11/17/09 View of Washburn Avenue outfall. Cloudy tan discharge plume visible.



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

July 06, 2011

Todd Borci - Mail Code OES04-4
US EPA New England R1

Project Number: 11060038
Project: Revere/Chelsea/Lexington CSI
Analysis: HPLC/MS/MS Source Tracking Analysis
Analyst: Peter Philbrook *PP 7-6-2011*

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-LCMS_STA.0.

The SOP is based on an EPA Regional Analytical Method developed at the EPA New England Laboratory.

Date Samples Received by the Laboratory: 06/22/2011

Data were reviewed in accordance with the internal verification procedures described in the EPA New England OEME Chemistry QA Plan.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

Report may contain multiple sections and each section will be numbered independently.

If you have any questions please call me at 617-918-8340

Sincerely,

Daniel N Boudreau 7/7/11

Daniel N Boudreau
Chemistry Team Leader

DATA QUALIFIERS

RL	Reporting limit
J	Estimated value
E	Estimated value exceeds the calibration range
L	Estimated value is below the calibration range
B	Analyte is associated with the lab blank or trip blank contamination.
R	No recovery was calculated since the analyte concentration is greater than four times the spike level.
ND	Not Detected above Reporting limit
NA	Not Applicable due to high sample dilutions or sample interferences
ME	Matrix Effect - Sample matrix was responsible for either enhanced or suppressed ionization within the electrospray ionization probe

NARRATIVE

Aqueous samples (500mL) were extracted using a solid phase extraction (SPE) technique, following EPA Method 1694, in which samples were passed through a cartridge containing a solid sorbent material which pre-concentrates the target compounds onto the sorbent. The target compounds (TCs) were then eluted off the sorbent material using methanol. The resulting eluant is concentrated to dryness and re-constituted to a final volume of 1 mL with 20/80 Methanol/Water.

A 5uL aliquot of the sample extract was injected into a High Performance Liquid Chromatograph (HPLC), and the TCs were separated chromatographically using a C8 HPLC column running a methanol / water gradient. The ionization mode used was electrospray with the polarity operating in the positive mode. The TCs were detected using a Waters Acquity TQD Tandem Quadrupole Mass Spectrometer. The tandem quadrupole is used to perform multiple reaction monitoring (MRM) where the precursor ion of interest is fragmented to product ion(s).

Quantitation was performed by the internal standard calibration method using isotopically labeled analogues. Sulfamethazine $^{13}\text{C}_6$ and Primidone d_5 were used as a surrogate compounds to monitor extraction efficiency.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI
HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mill 2A
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18938
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	6.1	2.0	B
103-90-2	Acetaminophen	4.2	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	27	4.0	
298-46-4	Carbamazepine	17	0.4	
486-56-6	Cotinine	19	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	74	23 - 181
Sulfamethazine 13C6	44	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mill 2
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18939
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	16	2.0	
103-90-2	Acetaminophen	3.3	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	7.7	4.0	B
298-46-4	Carbamazepine	10	0.4	
486-56-6	Cotinine	6.5	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	72	23 - 181
Sulfamethazine 13C6	33	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Mill Cr 1
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18940
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	42	2.0	
103-90-2	Acetaminophen	170	4.0	
29122-68-7	Atenolol	25	2.0	
58-08-2	Caffeine	340	8.0	
298-46-4	Carbamazepine	3.6	0.4	
486-56-6	Cotinine	14	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	89	23 - 181
Sulfamethazine 13C6	41	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI
HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Belle Is 1
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18941
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	10	2.0	B
103-90-2	Acetaminophen	ND	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	3.8	4.0	B,L
298-46-4	Carbamazepine	0.74	0.4	
486-56-6	Cotinine	6.2	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	72	23 - 181
Sulfamethazine 13C6	45	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Belle Is 2
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 440 mL

Lab Sample ID: AB18942
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	12	2.2	B
103-90-2	Acetaminophen	21	2.2	
29122-68-7	Atenolol	3.3	2.2	
58-08-2	Caffeine	15	4.4	B
298-46-4	Carbamazepine	0.93	0.4	
486-56-6	Cotinine	5.2	0.4	
57-68-1	Sulfamethazine	0.73	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	94	23 - 181
Sulfamethazine 13C6	38	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI
HPLC/MS/MS Source Tracking Analysis

Client Sample ID: MWRA 205
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18943
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1 & 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	670	20.0	
103-90-2	Acetaminophen	2800	20.0	
29122-68-7	Atenolol	110	2.0	
58-08-2	Caffeine	3000	40.0	
298-46-4	Carbamazepine	14	0.4	
486-56-6	Cotinine	73	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	83	23 - 181
Sulfamethazine 13C6	93	15 - 132

Comments: Urobilin estimated concentration = 450 ng/L

10X dilution was required to quantitate certain analytes.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Is End 03A
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 425 mL

Lab Sample ID: AB18944
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	540	23.6	
103-90-2	Acetaminophen	1500	23.6	
29122-68-7	Atenolol	57	23.6	
58-08-2	Caffeine	1200	47.2	
298-46-4	Carbamazepine	28	4.7	
486-56-6	Cotinine	48	4.7	
57-68-1	Sulfamethazine	8.2	4.7	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	85	23 - 181
Sulfamethazine 13C6	64	15 - 132

Comments: Urobilin estimated concentration = 260 ng/L

10X dilution was required to quantitate target compounds.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Is End 03Z
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18945
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	150	20.0	
103-90-2	Acetaminophen	460	20.0	
29122-68-7	Atenolol	21	20.0	
58-08-2	Caffeine	410	40.0	
298-46-4	Carbamazepine	7.2	4.0	
486-56-6	Cotinine	14	4.0	
57-68-1	Sulfamethazine	6.6	4.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	77	23 - 181
Sulfamethazine 13C6	47	15 - 132

Comments: Urobilin estimated concentration = 58 ng/L

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: Vine 01
Date of Collection: 6/22/2011
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: AB18946
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1 & 10
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	240	20.0	
103-90-2	Acetaminophen	440	20.0	
29122-68-7	Atenolol	26	2.0	
58-08-2	Caffeine	1200	40.0	
298-46-4	Carbamazepine	4.8	0.4	
486-56-6	Cotinine	8.0	0.4	
57-68-1	Sulfamethazine	1.3	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	81	23 - 181
Sulfamethazine 13C6	82	15 - 132

Comments: Urobilin estimated concentration = 290 ng/L

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Revere/Chelsea/Lexington CSI

Laboratory Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Extraction: 06/23/2011
Date of Analysis: 06/30/2011
Volume Extracted: 500 mL

Lab Sample ID: N/A
Matrix: Water
Final Volume: 1 mL
Extract Dilution: 1
pH: N/A

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
611-59-6	1,7-Dimethylxanthine	3.9	2.0	
103-90-2	Acetaminophen	ND	2.0	
29122-68-7	Atenolol	ND	2.0	
58-08-2	Caffeine	4.9	4.0	
298-46-4	Carbamazepine	ND	0.4	
486-56-6	Cotinine	ND	0.4	
57-68-1	Sulfamethazine	ND	0.4	

Surrogate Compounds	Recoveries (%)	QC Ranges
Sulfamethazine 13C3	104	
Primidone d5	109	

Comments: Caffeine and 1,7-Dimethylxanthine were detected in the blank near the reporting limit. Results in samples will be qualified as "B" if the concentration is < 3X the value found in the blank.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

MATRIX SPIKE RECOVERY

Revere/Chelsea/Lexington CSI

Sample ID: AB18942

PARAMETER	SPIKE ADDED ng/L	SAMPLE CONCENTRATION ng/L	MS CONCENTRATION ng/L	MS % REC	QC LIMITS (% REC)
1,7-Dimethylxanthine	136	12	168	115	7 - 120
Acetaminophen	136	21	165	106	1 - 120
Atenolol	136	3.3	122	87.3	40 - 146
Caffeine	273	15	189	63.7	12 - 138
Carbamazepine	27	0.93	27	95.5	27 - 144
Cotinine	27	5.2	30	90.8	48 - 131
Sulfamethazine	27	0.73	11	37.6	30 - 130

LABORATORY DUPLICATE RESULTS

Revere/Chelsea/Lexington CSI

Sample ID: AB18944

PARAMETER	SAMPLE RESULT ng/L	SAMPLE DUPLICATE RESULT ng/L	PRECISION RPD %	QC LIMITS
1,7-Dimethylxanthine	540	410	27.4	50
Acetaminophen	1500	1600	6.45	50
Atenolol	57	56	1.77	50
Caffeine	1200	1000	18.2	50
Carbamazepine	28	20	33.3	50
Cotinine	48	45	6.45	50
Sulfamethazine	8.2	8.0	2.47	50

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

LABORATORY FORTIFIED BLANK (LFB) RECOVERY

Revere/Chelsea/Lexington CSI

COMPOUND	SPIKE ADDED ng/L	LFB CONCENTRATION ng/L	LFB RECOVERY %	QC LIMITS (% REC)
1,7-Dimethylxanthine	120	115	95.8	14 - 155
Acetaminophen	120	112	93.3	43 - 129
Atenolol	120	106	88.3	45 - 136
Caffeine	240	195	81.2	57 - 132
Carbamazepine	24	24	100	39 - 136
Cotinine	24	23	95.8	60 - 127
Sulfamethazine	24	15	62.5	30 - 130

Comments: Urobilin recovery was 16%

EPA Region 1

Clean Water Act

Inspection Data Entry Form: 3560EZ

Inspector:	Erin Trainor	Date form completed:	7/1/2013
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Section A: Facility Information

Inspection start date:	6/27/2013	Inspection end date (if more than one day):	6/27/2013
NPDES ID:	MAR0141219	Federal facility?	No
Name and Location of Facility Inspected:			
Name:	City of Salem		
Address:	Enter text		
City:	Salem	State:	MA
ZIP:	01970		
Facility On-Site Representative #1:			
Name:	Rebecca Dupont-Coutu		
Title:	Assistant Engineer, New England Civil Engineering Corp. (consultant)		
Phone #:	9787417401	Fax # / email:	9787417402
Facility On-Site Representative #2 (if necessary):			
Name:	Enter text		
Title:	Enter text		
Phone #:	Enter text	Fax # / email:	Enter text

Section B: Compliance Monitoring Information

Clean Water Act Section (choose from only one of the following):	
CWA §308[A][B]: NPDES	Stormwater - MS4
CWA §311: Oil and Hazardous Substances	Choose an item
CWA §404: Permits for Dredge and Fill Material	Choose an item
Compliance Monitoring Type:	Inspection w/ Sampling
Compliance Monitoring Reason:	Agency Priority
If Agency Priority, then specify priority(s):	
OECA - CAFO	<input type="checkbox"/>
OECA - CAFO Region Initiative Areas	<input type="checkbox"/>
OECA - CSOs w/ < 50,000 service population	<input type="checkbox"/>
OECA - CSOs w/ >= 50,000 service population	<input type="checkbox"/>
OECA - MS4s Phase I	<input type="checkbox"/>
OECA - MS4s Phase II	<input checked="" type="checkbox"/>
Region 1 - Environmental Justice	<input type="checkbox"/>
Region 1 - Green Economy / Green Infrastructure	<input type="checkbox"/>
Region 1 - Industrial Laundries	<input type="checkbox"/>
Region 1 - Lead Poisoning	<input type="checkbox"/>
Region 1 - Municipal Infrastructure	<input type="checkbox"/>
Region 1 - Pollution Prevention & Resource Conservation	<input type="checkbox"/>

Region 1 - Ship / Boat Yards		<input type="checkbox"/>
Region 1 - Wet Weather		<input type="checkbox"/>
Compliance Monitoring Agency Type:		EPA
Was this a Joint Compliance Monitoring Activity?		No
Which party had the lead?		Choose an item or leave blank if N/A
If State lead, what was the purpose of EPA participation?		Choose an item or leave blank if N/A

Section C: ICDS Information		
Did you observe deficiencies (potential violations) during the inspection?		Yes
Potential excess emission in violation of regulations:		<input type="checkbox"/>
Potential failure to... ... complete or submit a notification, report, certification, or manifest:		<input type="checkbox"/>
... follow a permit condition(s):		<input type="checkbox"/>
... follow a required sample monitoring procedure or laboratory procedure:		<input type="checkbox"/>
... follow or develop a required management practice or procedure:		<input type="checkbox"/>
... identify and manage a regulated waste or pollutant in any media:		<input checked="" type="checkbox"/>
... maintain a record or failure to disclose a document:		<input type="checkbox"/>
... maintain/inspect/repair meters, sensors, and recording equipment:		<input type="checkbox"/>
... obtain a permit, product approval, or certification:		<input type="checkbox"/>
... report regulated events such as spills, accidents, etc.:		<input type="checkbox"/>
Potential incorrect use of a material (pesticide, waste, product) or use of an unapproved material:		<input type="checkbox"/>
Potential violation of a compliance schedule in an enforceable order:		<input type="checkbox"/>
If you observed deficiencies, did you communicate the deficiencies to the Facility during the inspection?		No
If yes, did you observe the Facility take any actions during the inspection to address the deficiencies noted?		No
If yes, what actions were taken?	Choose an item	
If the Facility reduced pollution, what pollutant was reduced?	Enter text	
Did you provide general compliance assistance in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?		No
Did you provide site-specific compliance assistance in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?		No

Comments:
Enter text



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 6 July 2009

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
City of Salem, MA

From: Todd Borci

To: File

On Wednesday, 17 June 2009, EPA inspector Todd Borci conducted an unannounced Compliance Sampling Inspection (CSI) of the City of Salem, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4"). EPA personnel collected surface water samples from an outfall located in Derby Wharf, south of the intersection of Derby Street and Orange Street, and from an outfall located along the northern wall of Strongwater Brook at 40 Commercial Street.

EPA personnel first sampled the Derby Wharf location (Sample ID: "Der01p"). The outfall was an approximately 24-inch concrete pipe fitted with a "duckbill" tide regulator. Water was observed to be flowing at 5 to 10-gallons per minute from the bottom of the closed "duckbill". Using Hach brand test strips for ammonia, and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. Ammonia test strips indicated an elevated level of ammonia (5.0 mg/l); and the surfactant field kit indicated an elevated reading as well (1.5 mg/l). A clean sample bottle was used to collect additional volume for measurement using a YSI conductivity/temperature/salinity meter. EPA recorded levels of 14.41mS/16.4 °C/10.1 ppt, respectively at the "Der01p" sample location.

EPA personnel next sampled the outfall across from 40 Commercial Street (Sample ID: "NorR01p"). The outfall is an approximately 24-inch diameter concrete pipe. The outfall discharges into a tidal canal at the terminus of Strongwater Brook, just prior to the start of the North River. The North River drains to the Danvers River and Beverly Harbor. Approximately 5 to 10 gallons per minute were observed discharging from the pipe, with gray/white bacterial plaque on the lip of the outfall. Using Hach brand test strips for ammonia, and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. Ammonia test strips indicated an elevated level of ammonia (6.0 mg/l); and the surfactant field kit indicated an elevated reading as well (1.8 mg/l). A clean sample bottle was used to collect additional volume for measurement using a YSI conductivity/temperature/salinity meter. EPA recorded levels of 16.15 mS/18.2 °C/11.0 ppt, respectively at the "NorR01p" sample location.

Once received, the analytical data for this sampling effort will be attached to this report.

Weather on the day of inspection was clear and sunny. According to the National Oceanic and Atmospheric Administration, the last measurable precipitation was 0.2 inches on 14 June 2009 (Logan Airport gauge).

Inspection ended at 1030. EPA Inspector will review data once received for enforcement follow-up.

End of Report.



Photo 1: 6/17/09 at 09:35 AM. View facing north of “Der01p” sample location along Derby Wharf in Salem Harbor.



Photo 2: 6/17/09 10:05 AM. View facing “NorR01p” outfall along northern bank of Strongwater Brook at low tide. Note white bacterial plaque at bottom of outfall pipe and small amount of suds where the discharge meets the streambed.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

Author: Andrew Spejewski

Drafted Date: September 30, 2011

Finalized Date:

Reviewed by:

Reviewed date:

I. Facility Information

A. *Facility Name:* City of Salem, Mass., MS4

B. *Facility Location:* Salem, MA

C. *Facility Contact:* David Knowlton, City Engineer

D. *Contact Mailing Address:* 120 Washington St, 4th Floor
Salem, MA 01970

E. *Permit #:* MA041219

II. Background Information

A. *Date of inspection:* September 15, 2011

B. *Weather Conditions:*

C. *US EPA Representative(s):* Andrew Spejewski

D. *State/Local Representative(s):* None

E. *Previous Enforcement Actions:* The MassDEP issued a Notice of Noncompliance to the City on September 5, 2007 regarding bacteria contamination in storm sewer outfall discharges. The City alleged that it has complied with the Notice to the MassDEP, but the MassDEP has not followed up (in part due to resource constraints).

III Purpose of Inspection

The inspection was an Audit establishing compliance with the City's MS4 permit. The City was targeted in part due to high bacteria results from testing of City outfalls by EPA and the Salem Sound Coastwatch.

City background:

The City of Salem has a population of about 41,000, and a median household income of \$44,000 (from the 2000 Census).

The City covers 8.1 square miles of land (plus another 10 square miles of water). Most of the City is moderately to heavily developed, with little land remaining for future greenfield development.

Preliminary Contacts

Mr. Spejewski initially contacted by phone Jason Silva, the contact listed on the annual reports. Mr. Silva eventually informed Mr. Spejewski that the program administrator was David Knowlton, City Engineer. Mr. Spejewski contacted Mr. Knowlton and set a date for the audit,

about two weeks after the initial contact with Mr. Silva. Mr. Spejewski stated that although SSCW did perform education to comply with the city's permit obligations, no SSCW representatives needed to attend the audit, only the city's liaison with SSCW.

Audit procedure

Mr. Spejewski arrived at the Salem Engineering offices, and there met Mr. Knowlton, and Alan Benevides and Janet Noonan both of Woodard and Curran. All three were present for the entire audit. The group was later joined by Rebecca Dupont-Couto of New England Civil Engineers during the IDDE program discussion. Mayor Kimberly Driscoll briefly introduced herself during the morning session, but did not stay.

After breaking for lunch, the group re-convened at the Salem Department of Public Works facility for an inspection [a separate inspection report for the facility exists]. After the tour, the group returned to the Engineering offices, until the audit concluded.

Unless otherwise credited, all statements about the City activities were made or confirmed by Mr. Knowlton.

General MS4

Infrastructure overview

The City owns and operates its storm sewer system. According to Mr. Knowlton, there are about 350 outfalls and 4,000 catchbasins.

There are no known remaining combined sanitary/storm sewers; Mr. Knowlton stated they had all been removed in the 1990s.

The vast majority of the town uses sanitary sewers, though Mr. Knowlton believes there are a few septic systems in outlying areas.

There are no known interconnections with neighboring municipalities. The campus of Salem State College includes storm drains which do connect to City-owned drains.

According to Mr. Knowlton, much of the MS4 is tidally-influenced. Flooding is also a problem in parts of the city.

The active components of the storm sewer system include one pump for stormwater, as well as several tide gates.

Mr. Knowlton stated that there is a major project underway to re-route stormwater flow from the downtown area to the east, into the North River. This project is primarily to increase flow capacity to reduce flooding.

The city's sanitary sewage is treated at a POTW located within the city, but owned and operated by a regional authority.

Significant facilities contributing to stormwater in the city include Salem State College, and Salem Hospital. The POTW and the Salem Harbor coal/oil-fired power station are also present within the City.

MS4 Program

The City submitted an NOI for the MS4 general permit on July 31, 2003, and on October 7, 2003, EPA authorized Permit No. MA041219.

According to Mr. Knowlton, the city's MS4 program was originally split between various departments, but was centralized when he was hired as City Engineer in 2006. DK stated that he ran the program with input from the conservation commission, planning board, and DPW. Significant amounts of planning and reporting work are done by consultants Woodard and Curran. [Both Woodard and Curran and New England Civil Engineers also do most of the fieldwork and investigations for the program]

Ms. Noonan pointed out that the Board of Health does beach monitoring sampling. Mr. Knowlton also noted that the Salem Sound Coastwatch does stormwater education for the city.

Mr. Knowlton stated that he was unaware whether Salem State College had a dedicated MS4 program, and he has not interacted with it if it does. However, he has, for instance notified the college that no increases in stormwater volume could be accepted at certain connections from Salem State to the city MS4 (so that planned construction would need to route stormwater in other directions). Mr. Knowlton stated there have been no problems with these interactions.

Minimum Control Measures

1 Education

The city contracts with Salem Sound Coastwatch to do stormwater education on the city's behalf. According to Mr. Knowlton, the city gives \$5,000 a year to the SSCW, but there is no contract or other formal agreement for the work SSCW does.

Mr. Knowlton was unsure of SSCW's relationship with other municipalities in the area.

Samples of SSCW brochures were produced [in audit file]. Mr. Knowlton was unsure how many were actually distributed.

A copy of a newspaper article about stormwater impacts from the Boston Globe dated April 22, 2010 was produced.

The SSCW website was referenced as a component of the educational program.

Stencils on catchbasins were done early in the program. The city has not done any recently.

2 Public Involvement

◇

3 Illicit Discharges

Mr. Knowlton explained that most of the actual illicit detection work is currently done by New England Civil Engineering (NECE). Woodard and Curran did work in the past.

The city has the MS4 system mapped on a GIS database, including outfalls, manholes and catchbasins. Mr. Knowlton demonstrated the map on his computer [a screenshot is in the file]. Data linked in the GIS database includes size, material, condition, date surveyed (primarily 2008), comments and a photo [printout of a portion of the database is in the file].

There are no records that the mapping survey collected data on dry weather flow or other signs of potential illicit connections. RDC stated the survey done by NECE was for location only, not screening for illicit.

Mr. Knowlton stated that the city has focused on responding to areas where signs of illicit connections are clear (i.e. responding to SSCW's testing), before going to look at other areas.

Mr. Knowlton stated the city has done very little testing of outfalls, relying on SSCW's data.

Mr. Knowlton stated that there is no formal tracking of complaints, though there are not very complaints of potential illicit.

The city completed an infiltration and inflow survey for sanitary sewers in 2010.

Mr. Knowlton and RDC described several illicit investigations in the last two or three years: At the Commercial Street outfall, SSCW data showed high bacteria. Remote closed-circuit television examination of the pipes found several illicit sewage connections, which were then removed. The city did not follow-up testing, relying on SSCW data. No written report was available.

At Derby Wharf, the area is difficult to CCTV, so house to house searching and dye-testing was done. A gift shop was found to be discharging sewage directly to the ground (not connected to any pipes), and was removed. No manholes were inspected here. A copy of an e-mail from RDC to Mr. Knowlton was produced [copy in file]. The e-mail detailed testing done at the Derby St outfall and two rounds of testing at upstream manholes. The tests showed a mix of high and low counts before removing the gift shop, and one low count afterwards (in Jan 2010).

At Foster street, the city is CCTVing lines to find ways to limit flow to control flooding, but is looking for illicit connections at the same time.

MB described an investigation done earlier by Woodard and Curran at Juniper beach. Sampling immediately uphill of the beach revealed no bacteria. It was concluded that bacteria were being washed into the outfall by the tide, and a duckbill was fitted to the end of the pipe, which apparently helped. No written documentation was produced for this investigation.

<details of other reports>

A list and map of illicit connections removed was produced [list and map in file]. 14 connections were removed from May 2009 to May 2010.

Mr. Knowlton stated the city has had no issues with removing known illicit connections. The city has paid for the construction work, feeling it was unfair to penalize homeowners.

Mr. Knowlton stated that, though it has not been tested in court, the city believes they have legal authority to order removal of illicit connections. A copy of the relevant by-law with sections highlighted was produced.

Mr. Knowlton stated that there is also authority to prohibit dumping, including to the storm sewers with a potential \$5,000 fine. Mr. Knowlton again produced a copy of the relevant city by-law with applicable sections highlighted.

Mr. Knowlton stated that the city has had occasional sanitary sewer overflows, the last time twice in 2007, due in every instance to issues at pump stations.

4 Construction

Mr. Knowlton stated that a draft bylaw for controlling erosion at construction sites (and post-construction impacts) has been submitted to the City Council.

Mr. Knowlton and the Woodard and Curran representatives explained that a draft version had been finished many years ago, and Woodard and Curran had so many requests for it from other towns that they put it on their website.

Mr. Knowlton could not explain why it was never passed by the City Council.

Mr. Knowlton stated that Salem was mostly developed, so there were relatively few construction projects in the City.

Mr. Knowlton stated that the ConComm reviews projects for wetlands impacts and Planning reviews larger projects. The City Engineer (Mr. Knowlton) also reviews some projects, and the City has hired outside consultants to review plans.

Mr. Knowlton showed a spreadsheet showing all development projects in the town (greater than one acre) since August 2004, a total of 36 [copy in file, handwritten notes by Mr. Spejewski]. The spreadsheet indicates project; area; whether the planning board and/or concomm approved the project; whether the conservation agent, City Engineer, or consultant engineer reviewed the stormwater plans; the construction status; whether the project was inspected by the City Engineer, Conservation Agent, or consultant; whether reports were submitted; and whether enforcement was taken.

Mr. Knowlton explained that all enforcement to date was by the conservation commission for wetlands issues; 3 of the 4 listed cases included fines.

Mr. Knowlton provided a printout of projects with federal NOIs for the Construction General Permit since 2003 [copy in file] showing only 20 projects since 2003. Mr. Knowlton stated the City does not generally check to see whether projects have submitted an NOI for the federal permit.

5 Post Construction

Mr. Knowlton stated that the same by-law addresses post-construction impacts and erosion control during construction; it has been submitted to the City Council but not passed.

Mr. Knowlton stated he does look for post-construction impacts during his review of projects. [Note the earlier description of Mr. Knowlton forbidding Salem State College from sending more stormwater to particular areas of the MS4].

The city requires a maintenance plan for post-construction BMPs, and can require submission of maintenance reports. The City tries to avoid taking ownership of BMPs.

For existing industrial facilities, Mr. Knowlton was unaware of any that might produce wastewater that affects the MS4, except the power plant and POTW, both of which he assumes are already regulated.

Maintenance & Housekeeping

[For most of this, the previous group met at the DPW Headquarters with Rick Rennard, Director of the City Department of Public Works]

According to Mr. Knowlton, catchbasin cleaning is done by contractors, and tracked by the City Engineer's office. They were last all cleaned in 2009. The next round will focus on those that had more than one cubic yard removed in the 2009 round (about 554 out of 875 total). The contractor is responsible for disposing of the sediment.

Mr. Knowlton stated that the contractor would report on catchbasins needing maintenance. Mr. Spejewski asked if the contractors were required to report on signs of potential illicit connections, such as odor. Mr. Knowlton said no, but it was a good idea for future contracts.

MR mentioned that the DPW does 500 -700 catchbasin cleanings a year with a vactor truck, but these are not tracked (except on daily work reports).

According to Mr. Knowlton, street sweeping is done by contract and in-house. Residential areas and parking lots are swept twice a year by contractors [a copy of a newspaper article informing residents of upcoming sweeping is in the file]. The downtown and main entry routes are swept by the DPW at least 3 times per year. MR stated the sweepings have a beneficial re-use determination from the MA DEP.

MR stated sidewalks in the downtown are also swept.

According to the group, the schools in Salem are swept and maintained by the School Department using a separate contractor. Mr. Knowlton noted that the high school field has an underdrain that is connected to the sanitary sewer; as certain pesticides used on the field require sanitary disposal.

Mr. Knowlton stated there is no regular schedule of inspecting and/or replacing pipes and other infrastructure.

There are several state-owned roads in Salem, but only two sections are maintained by the state; for the rest the City sweeps, plows and maintains. DK believes that the catchbasins on state-owned roads are on his system map.

MR stated that the City uses a salt/sand mix, though they try to keep the sand down for easy cleaning. About 60-70 potential contractors are used along with city equipment and personnel. No ground-speed controlled spreaders are used, but drivers are trained to turn off the spreader at stops.

The city uses little pesticides, only for weeds on the street. MR produced a wallet card for his pesticide license.

Maintenance of park lawns is a contract; MR stated the contract supervisor was not available this day.

The City owns a golf course, run out of the Recreation Department, and the school grounds are maintained by the School Department.

At this point, the group began an inspection of the DPW facility itself. The inspection report is attached as a separate document.

[Following the DPW yard tour, the original group re-convened at the City Engineers office for a short concluding session, then Mr. Spejewski left the facility].



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

DATE: July 30, 2013

SUBJ: MS4 Compliance Sampling Inspection
City of Salem, Massachusetts

FROM: Erin Trainor, Inspector

TO: File

REQUESTED BY: Andrew Spejewski

I. Background Information

- A. Date, Time of inspection: Thursday, June 27, 2013, 7:30 AM
- B. Weather Conditions: Overcast, approximately 65 degrees F
- C. USEPA Representatives: Erin Trainor
Andrew Spejewski
- D. Site Representative(s): David Knowlton, P.E.
City Engineer, City of Salem
120 Washington Street, 4th Floor
Salem, MA 01970

Note: The Site Representative was not on site at the time of the inspection; however the following representatives were on site.

- On-Site Representative(s): Giovanna Zabaleta
Junior Engineer, City of Salem
120 Washington Street, 4th Floor
Salem, MA 01970
- Rebecca Dupont-Coutu
Assistant Engineer, New England Civil Engineering Corp.
120 Washington Street, Suite 202E
Salem, MA 01970
- E. Address: Various locations along the North River, Salem Harbor, and
Salem Sound.

II. Purpose of Inspection

The purpose of the inspection was to identify illicit connections or illegal discharges within the City of Salem municipal separate stormwater sewer system (MS4) that may adversely impact the water quality. The City of Salem has been issued permit number MAR041219. Samples were collected from thirteen stormwater outfalls and/or manholes in accordance with the Environmental Investigations and Analysis (EIA) unit Stormwater Program Plan.

III. Description of Sample Locations

- Outfall located at the end of Juniper Ave., along Beach Ave., identified as Outfall176.
- Manhole upstream of Outfall176, located along Beach Ave., identified as MH4378.
- Manhole upstream of Outfall176, located along Juniper Ave., identified as MH4375.
- Outfall located along Derby Street west of s/v Friendship, identified as Outfall01.
- Manhole upstream of Outfall01, located along Derby Street, identified as MH154.
- Outfall within MH154, identified as MH154a.
- Manhole upstream of Outfall140, located along Mason Street and drains the Mason Street (north of the manhole) and North Street neighborhoods, identified as MH5696A.
- Manhole upstream of Outfall140, located along Mason Street and drains the Buffum Street neighborhood, identified as MH5696B.
- Manhole upstream of Outfall138, located on Dunlap Street and runs southwest along Devereaux Street, identified as MH4448.
- Manhole upstream of Outfall138 and north of MH4448, and runs northwest along Dunlap Street, identified as MH4449.
- Outfall located along Commercial Street and discharges into the North River, identified as Outfall138.
- Outfall located along Commercial Street, northeast of Outfall138 and discharges into the North River, identified as Outfall140.
- Manhole located along Pioneer Terrace, identified as MH3516.

IV. Inspection Observations and Findings

On Thursday, June 27, 2013, EPA inspectors Andrew Spejewski and Erin Trainor conducted a Compliance Sampling Inspection (CSI) within the City of Salem, Massachusetts at thirteen (13) locations throughout the City.

The inspection started in Salem at approximately 7:30 AM. At the time of the inspection, the weather was overcast and approximately 65 degrees Fahrenheit. According to weather underground (www.weatherunderground.com), 0.82 inches of rain was reported on June 26, 2013.

The sampling locations described in Section III were field screened using test kits for ammonia, chlorine, and surfactants and analyzed at the EPA New England Regional Laboratory (NERL) for E.Coli, Enterococcus, and pharmaceutical and personal care products (PPCPs) including: Atenolol, Acetaminophen, Cotinine, 1,7-Dimethylxanthine, Caffeine, Carbamazepine, and Metoprolol. In-situ measurements for conductivity, salinity, and temperature were also recorded.

The following table summarizes the findings. Laboratory results are anticipated to be available July 2013. Photographs are included.

End of Report

Attachments: Table 1: Summary of Salem, MA MS4 Inspection – June 27, 2013

Photographs

Table 1: Summary of Salem, MA MS4 Inspection – June 27, 2013

Sample ID	Outfall76	MH4378	MH4375	Outfall01	MH154	MH154a	MH5696a
Time	08:00	08:15	08:30	09:15	09:30	09:40	10:05
Latitude/Longitude	42.53424139 N / 70.86584411 W	42.53370654 N / 70.86592301 W	42.53379786 N / 70.86702364 W	42.52109437 N / 70.88711704 W	42.52133268 N / 70.88711278 W	42.52133268 N / 70.88711278 W	42.52565937 N / 70.90179439 W
Description of Location	Outfall located at the end of Juniper Ave., along Beach Ave.	Manhole upstream of Outfall76, located along Beach Ave.	Manhole upstream of Outfall76, located along Juniper Ave.	Outfall located along Derby Street west of s/v Friendship.	Manhole upstream of Outfall01, located along Derby Street.	Outfall within MH154.	Manhole upstream of Outfall140, located along Mason Street and drains the Mason Street and North Street neighborhoods.
Physical Observations	Flow approx. 10 GPM	Flow approx 5 GPM	Flow approx 5 GPM	Flow approx 30 GPM	Low flow, in situ measurements were collected from pool beneath outfall	Reportedly drains a chamber containing groundwater.	Flow < 1 GPM
Temperature, °C	17.8	19.1	16.9	16.9	16.8	NA	17.2
Specific Conductivity, µS	15.97 (mS)	9.20 (mS)	2,869	25.0 (mS)	18.01 (mS)	NA	1,167
Salinity, ppt	9.5	0.1	1.5	16.1	10.7	NA	0.1
Ammonia, mg/L	0.5	0	0	0.5	0	NA	0.25
Total Residual Chlorine, mg/L	0.05	0.01	0.00	0.05	0.04	NA	0.02
Surfactants, mg/L	NA	0.75	NA	NA	NA	NA	0.25
1,7 - Dimethylxanthine	120	43	2.0	2.4	4.9	6.4	25
Acetaminophen, ng/L	230	32	0.94	ND	0.74	ND	19
Atenolol, ng/L	15	7.5	ND	ND	ND	ND	ND
Caffeine, ng/L	420	130	25	33	100	42	1,600
Carbamazepine, ng/L	1.7	4.8	ND	ND	0.28	ND	ND
Cotinine, ng/L	25	17	1.1	2.3	7.0	2.8	51
Metoprolol, ng/L	7.4	9.4	ND	ND	ND	ND	ND
E.Coli, MPN	2,069	241	225	2,318	1,741	5,199	621
Enterococcus, MPN	684	1,081	364	1,246	154	1,334	1,178

NA: Not analyzed due to high salinity readings, low flows, and/or constraints on time

ND: Not detected above reporting limit

Table 1: Summary of Salem, MA MS4 Inspection – June 27, 2013

Sample ID	MH5696b	MH4448	MH4449	Outfall138	Outfall140	MH3516
Time	10:25	10:55	11:10	11:45	12:00	12:35
Latitude/Longitude	42.52565937 N / 70.90179439 W	42.52590121 N / 70.90625592 W	42.52594518 N / 70.90619359	42.52355723 N / 70.902895 W	42.52443019 N / 70.90058451 W	42.51314289 N / 70.88893123 W
Description of Location	Manhole upstream of Outfall140, located along Mason Street and drains the Buffum Street neighborhood.	Manhole upstream of Outfall138, located on Dunlap Street and runs southwest along Devereaux Street.	Manhole upstream of Outfall138 and north of MH4448, and runs northwest along Dunlap Street.	Outfall located along Commercial Street and discharges into the North River.	Outfall located along Commercial Street, northeast of Outfall138 and discharges into the North River.	Manhole located along Pioneer Terrace.
Physical Observations	Flow < 1 GPM	Reportedly drains wetland area.	Flow approx 50 GPM	Partially submerged.	3:04 hours after low tide.	3:39 hours after low tide.
Temperature, °C	17.2	NA	NA	16.3	18.5	16.8
Specific Conductivity, µS	1,167	NA	NA	6.0 (mS)	8.94 (mS)	29.3 (mS)
Salinity, ppt	0.1	NA	NA	3.2	4.9	18.2
Ammonia, mg/L	1.0	6	0	0	0	NA
Total Residual Chlorine, mg/L	0.02	0.05	0.01	0.02	0.02	NA
Surfactants, mg/L	0.20	0.25	0.25	NA	NA	NA
1,7 - Dimethylxanthine	6.6	460	2.1	17	3.2	55
Acetaminophen, ng/L	ND	12,000	ND	13	ND	240
Atenolol, ng/L	ND	ND	ND	ND	ND	32
Caffeine, ng/L	250	2,100	21	110	73	260
Carbamazepine, ng/L	ND	ND	1.2	1.6	0.42	4.6
Cotinine, ng/L	1.7	16	0.9	1.2	2.6	11
Metoprolol, ng/L	ND	2,800	ND	5.6	ND	36
E.Coli, MPN	1,844	9,678	25	192	297	3,683
Enterococcus, MPN	122	5,172	86	259	538	3,873

NA: Not analyzed due to high salinity readings, low flows, and/or constraints on time

ND: Not detected above reporting limit



Outfall76: Outfall located at the end of Juniper Ave., along Beach Ave.



MH4378: Manhole upstream of Outfall76, located along Beach Ave.



MH4375: Manhole upstream of Outfall76, located along Juniper Ave.



Outfall01: Outfall located along Derby Street west of s/v Friendship.



MH154/MH154a: Manhole upstream of Outfall01, located along Derby Street.



MH5696a/MH5696b: Manhole upstream of Outfall1140, located along Mason Street.



MH4448: Manhole upstream of Outfall138, located on Dunlap Street and runs southwest along Devereaux Street.



Outfall138: Outfall located along Commercial Street and discharges into the North River.



Outfall140: Outfall located along Commercial Street, northeast of Outfall138 and discharges into the North River.



MH3516: Manhole located along Pioneer Terrace.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 6 July 2009

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
City of Salem, MA

From: Todd Borci

To: File

On Wednesday, 17 June 2009, EPA inspector Todd Borci conducted an unannounced Compliance Sampling Inspection (CSI) of the City of Salem, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4"). EPA personnel collected surface water samples from an outfall located in Derby Wharf, south of the intersection of Derby Street and Orange Street, and from an outfall located along the northern wall of Strongwater Brook at 40 Commercial Street.

EPA personnel first sampled the Derby Wharf location (Sample ID: "Der01p"). The outfall was an approximately 24-inch concrete pipe fitted with a "duckbill" tide regulator. Water was observed to be flowing at 5 to 10-gallons per minute from the bottom of the closed "duckbill". Using Hach brand test strips for ammonia, and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. Ammonia test strips indicated an elevated level of ammonia (5.0 mg/l); and the surfactant field kit indicated an elevated reading as well (1.5 mg/l). A clean sample bottle was used to collect additional volume for measurement using a YSI conductivity/temperature/salinity meter. EPA recorded levels of 14.41mS/16.4 °C/10.1 ppt, respectively at the "Der01p" sample location.

EPA personnel next sampled the outfall across from 40 Commercial Street (Sample ID: "NorR01p"). The outfall is an approximately 24-inch diameter concrete pipe. The outfall discharges into a tidal canal at the terminus of Strongwater Brook, just prior to the start of the North River. The North River drains to the Danvers River and Beverly Harbor. Approximately 5 to 10 gallons per minute were observed discharging from the pipe, with gray/white bacterial plaque on the lip of the outfall. Using Hach brand test strips for ammonia, and a Chemetrics K-9400 field kit for surfactants, EPA personnel processed surface water samples collected at the location. Ammonia test strips indicated an elevated level of ammonia (6.0 mg/l); and the surfactant field kit indicated an elevated reading as well (1.8 mg/l). A clean sample bottle was used to collect additional volume for measurement using a YSI conductivity/temperature/salinity meter. EPA recorded levels of 16.15 mS/18.2 °C/11.0 ppt, respectively at the "NorR01p" sample location.

Once received, the analytical data for this sampling effort will be attached to this report.

Weather on the day of inspection was clear and sunny. According to the National Oceanic and Atmospheric Administration, the last measurable precipitation was 0.2 inches on 14 June 2009 (Logan Airport gauge).

Inspection ended at 1030. EPA Inspector will review data once received for enforcement follow-up.

End of Report.



Photo 1: 6/17/09 at 09:35 AM. View facing north of “Der01p” sample location along Derby Wharf in Salem Harbor.



Photo 2: 6/17/09 10:05 AM. View facing “NorR01p” outfall along northern bank of Strongwater Brook at low tide. Note white bacterial plaque at bottom of outfall pipe and small amount of suds where the discharge meets the streambed.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

Author: Andrew Spejewski

Drafted Date: September 30, 2011

Finalized Date:

Reviewed by:

Reviewed date:

I. Facility Information

A. *Facility Name:* City of Salem, Mass., MS4

B. *Facility Location:* Salem, MA

C. *Facility Contact:* David Knowlton, City Engineer

D. *Contact Mailing Address:* 120 Washington St, 4th Floor
Salem, MA 01970

E. *Permit #:* MA041219

II. Background Information

A. *Date of inspection:* September 15, 2011

B. *Weather Conditions:*

C. *US EPA Representative(s):* Andrew Spejewski

D. *State/Local Representative(s):* None

E. *Previous Enforcement Actions:* The MassDEP issued a Notice of Noncompliance to the City on September 5, 2007 regarding bacteria contamination in storm sewer outfall discharges. The City alleged that it has complied with the Notice to the MassDEP, but the MassDEP has not followed up (in part due to resource constraints).

III Purpose of Inspection

The inspection was an Audit establishing compliance with the City's MS4 permit. The City was targeted in part due to high bacteria results from testing of City outfalls by EPA and the Salem Sound Coastwatch.

City background:

The City of Salem has a population of about 41,000, and a median household income of \$44,000 (from the 2000 Census).

The City covers 8.1 square miles of land (plus another 10 square miles of water). Most of the City is moderately to heavily developed, with little land remaining for future greenfield development.

Preliminary Contacts

Mr. Spejewski initially contacted by phone Jason Silva, the contact listed on the annual reports. Mr. Silva eventually informed Mr. Spejewski that the program administrator was David Knowlton, City Engineer. Mr. Spejewski contacted Mr. Knowlton and set a date for the audit,

about two weeks after the initial contact with Mr. Silva. Mr. Spejewski stated that although SSCW did perform education to comply with the city's permit obligations, no SSCW representatives needed to attend the audit, only the city's liaison with SSCW.

Audit procedure

Mr. Spejewski arrived at the Salem Engineering offices, and there met Mr. Knowlton, and Alan Benevides and Janet Noonan both of Woodard and Curran. All three were present for the entire audit. The group was later joined by Rebecca Dupont-Couto of New England Civil Engineers during the IDDE program discussion. Mayor Kimberly Driscoll briefly introduced herself during the morning session, but did not stay.

After breaking for lunch, the group re-convened at the Salem Department of Public Works facility for an inspection [a separate inspection report for the facility exists]. After the tour, the group returned to the Engineering offices, until the audit concluded.

Unless otherwise credited, all statements about the City activities were made or confirmed by Mr. Knowlton.

General MS4

Infrastructure overview

The City owns and operates its storm sewer system. According to Mr. Knowlton, there are about 350 outfalls and 4,000 catchbasins.

There are no known remaining combined sanitary/storm sewers; Mr. Knowlton stated they had all been removed in the 1990s.

The vast majority of the town uses sanitary sewers, though Mr. Knowlton believes there are a few septic systems in outlying areas.

There are no known interconnections with neighboring municipalities. The campus of Salem State College includes storm drains which do connect to City-owned drains.

According to Mr. Knowlton, much of the MS4 is tidally-influenced. Flooding is also a problem in parts of the city.

The active components of the storm sewer system include one pump for stormwater, as well as several tide gates.

Mr. Knowlton stated that there is a major project underway to re-route stormwater flow from the downtown area to the east, into the North River. This project is primarily to increase flow capacity to reduce flooding.

The city's sanitary sewage is treated at a POTW located within the city, but owned and operated by a regional authority.

Significant facilities contributing to stormwater in the city include Salem State College, and Salem Hospital. The POTW and the Salem Harbor coal/oil-fired power station are also present within the City.

MS4 Program

The City submitted an NOI for the MS4 general permit on July 31, 2003, and on October 7, 2003, EPA authorized Permit No. MA041219.

According to Mr. Knowlton, the city's MS4 program was originally split between various departments, but was centralized when he was hired as City Engineer in 2006. DK stated that he ran the program with input from the conservation commission, planning board, and DPW. Significant amounts of planning and reporting work are done by consultants Woodard and Curran. [Both Woodard and Curran and New England Civil Engineers also do most of the fieldwork and investigations for the program]

Ms. Noonan pointed out that the Board of Health does beach monitoring sampling. Mr. Knowlton also noted that the Salem Sound Coastwatch does stormwater education for the city.

Mr. Knowlton stated that he was unaware whether Salem State College had a dedicated MS4 program, and he has not interacted with it if it does. However, he has, for instance notified the college that no increases in stormwater volume could be accepted at certain connections from Salem State to the city MS4 (so that planned construction would need to route stormwater in other directions). Mr. Knowlton stated there have been no problems with these interactions.

Minimum Control Measures

1 Education

The city contracts with Salem Sound Coastwatch to do stormwater education on the city's behalf. According to Mr. Knowlton, the city gives \$5,000 a year to the SSCW, but there is no contract or other formal agreement for the work SSCW does.

Mr. Knowlton was unsure of SSCW's relationship with other municipalities in the area.

Samples of SSCW brochures were produced [in audit file]. Mr. Knowlton was unsure how many were actually distributed.

A copy of a newspaper article about stormwater impacts from the Boston Globe dated April 22, 2010 was produced.

The SSCW website was referenced as a component of the educational program.

Stencils on catchbasins were done early in the program. The city has not done any recently.

2 Public Involvement

◇

3 Illicit Discharges

Mr. Knowlton explained that most of the actual illicit detection work is currently done by New England Civil Engineering (NECE). Woodard and Curran did work in the past.

The city has the MS4 system mapped on a GIS database, including outfalls, manholes and catchbasins. Mr. Knowlton demonstrated the map on his computer [a screenshot is in the file]. Data linked in the GIS database includes size, material, condition, date surveyed (primarily 2008), comments and a photo [printout of a portion of the database is in the file].

There are no records that the mapping survey collected data on dry weather flow or other signs of potential illicit connections. RDC stated the survey done by NECE was for location only, not screening for illicit.

Mr. Knowlton stated that the city has focused on responding to areas where signs of illicit connections are clear (i.e. responding to SSCW's testing), before going to look at other areas.

Mr. Knowlton stated the city has done very little testing of outfalls, relying on SSCW's data.

Mr. Knowlton stated that there is no formal tracking of complaints, though there are not very complaints of potential illicit.

The city completed an infiltration and inflow survey for sanitary sewers in 2010.

Mr. Knowlton and RDC described several illicit investigations in the last two or three years: At the Commercial Street outfall, SSCW data showed high bacteria. Remote closed-circuit television examination of the pipes found several illicit sewage connections, which were then removed. The city did not follow-up testing, relying on SSCW data. No written report was available.

At Derby Wharf, the area is difficult to CCTV, so house to house searching and dye-testing was done. A gift shop was found to be discharging sewage directly to the ground (not connected to any pipes), and was removed. No manholes were inspected here. A copy of an e-mail from RDC to Mr. Knowlton was produced [copy in file]. The e-mail detailed testing done at the Derby St outfall and two rounds of testing at upstream manholes. The tests showed a mix of high and low counts before removing the gift shop, and one low count afterwards (in Jan 2010).

At Foster street, the city is CCTVing lines to find ways to limit flow to control flooding, but is looking for illicit connections at the same time.

MB described an investigation done earlier by Woodard and Curran at Juniper beach. Sampling immediately uphill of the beach revealed no bacteria. It was concluded that bacteria were being washed into the outfall by the tide, and a duckbill was fitted to the end of the pipe, which apparently helped. No written documentation was produced for this investigation.

<details of other reports>

A list and map of illicit connections removed was produced [list and map in file]. 14 connections were removed from May 2009 to May 2010.

Mr. Knowlton stated the city has had no issues with removing known illicit connections. The city has paid for the construction work, feeling it was unfair to penalize homeowners.

Mr. Knowlton stated that, though it has not been tested in court, the city believes they have legal authority to order removal of illicit connections. A copy of the relevant by-law with sections highlighted was produced.

Mr. Knowlton stated that there is also authority to prohibit dumping, including to the storm sewers with a potential \$5,000 fine. Mr. Knowlton again produced a copy of the relevant city by-law with applicable sections highlighted.

Mr. Knowlton stated that the city has had occasional sanitary sewer overflows, the last time twice in 2007, due in every instance to issues at pump stations.

4 Construction

Mr. Knowlton stated that a draft bylaw for controlling erosion at construction sites (and post-construction impacts) has been submitted to the City Council.

Mr. Knowlton and the Woodard and Curran representatives explained that a draft version had been finished many years ago, and Woodard and Curran had so many requests for it from other towns that they put it on their website.

Mr. Knowlton could not explain why it was never passed by the City Council.

Mr. Knowlton stated that Salem was mostly developed, so there were relatively few construction projects in the City.

Mr. Knowlton stated that the ConComm reviews projects for wetlands impacts and Planning reviews larger projects. The City Engineer (Mr. Knowlton) also reviews some projects, and the City has hired outside consultants to review plans.

Mr. Knowlton showed a spreadsheet showing all development projects in the town (greater than one acre) since August 2004, a total of 36 [copy in file, handwritten notes by Mr. Spejewski]. The spreadsheet indicates project; area; whether the planning board and/or concomm approved the project; whether the conservation agent, City Engineer, or consultant engineer reviewed the stormwater plans; the construction status; whether the project was inspected by the City Engineer, Conservation Agent, or consultant; whether reports were submitted; and whether enforcement was taken.

Mr. Knowlton explained that all enforcement to date was by the conservation commission for wetlands issues; 3 of the 4 listed cases included fines.

Mr. Knowlton provided a printout of projects with federal NOIs for the Construction General Permit since 2003 [copy in file] showing only 20 projects since 2003. Mr. Knowlton stated the City does not generally check to see whether projects have submitted an NOI for the federal permit.

5 Post Construction

Mr. Knowlton stated that the same by-law addresses post-construction impacts and erosion control during construction; it has been submitted to the City Council but not passed.

Mr. Knowlton stated he does look for post-construction impacts during his review of projects. [Note the earlier description of Mr. Knowlton forbidding Salem State College from sending more stormwater to particular areas of the MS4].

The city requires a maintenance plan for post-construction BMPs, and can require submission of maintenance reports. The City tries to avoid taking ownership of BMPs.

For existing industrial facilities, Mr. Knowlton was unaware of any that might produce wastewater that affects the MS4, except the power plant and POTW, both of which he assumes are already regulated.

Maintenance & Housekeeping

[For most of this, the previous group met at the DPW Headquarters with Rick Rennard, Director of the City Department of Public Works]

According to Mr. Knowlton, catchbasin cleaning is done by contractors, and tracked by the City Engineer's office. They were last all cleaned in 2009. The next round will focus on those that had more than one cubic yard removed in the 2009 round (about 554 out of 875 total). The contractor is responsible for disposing of the sediment.

Mr. Knowlton stated that the contractor would report on catchbasins needing maintenance. Mr. Spejewski asked if the contractors were required to report on signs of potential illicit connections, such as odor. Mr. Knowlton said no, but it was a good idea for future contracts.

MR mentioned that the DPW does 500 -700 catchbasin cleanings a year with a vactor truck, but these are not tracked (except on daily work reports).

According to Mr. Knowlton, street sweeping is done by contract and in-house. Residential areas and parking lots are swept twice a year by contractors [a copy of a newspaper article informing residents of upcoming sweeping is in the file]. The downtown and main entry routes are swept by the DPW at least 3 times per year. MR stated the sweepings have a beneficial re-use determination from the MA DEP.

MR stated sidewalks in the downtown are also swept.

According to the group, the schools in Salem are swept and maintained by the School Department using a separate contractor. Mr. Knowlton noted that the high school field has an underdrain that is connected to the sanitary sewer; as certain pesticides used on the field require sanitary disposal.

Mr. Knowlton stated there is no regular schedule of inspecting and/or replacing pipes and other infrastructure.

There are several state-owned roads in Salem, but only two sections are maintained by the state; for the rest the City sweeps, plows and maintains. DK believes that the catchbasins on state-owned roads are on his system map.

MR stated that the City uses a salt/sand mix, though they try to keep the sand down for easy cleaning. About 60-70 potential contractors are used along with city equipment and personnel. No ground-speed controlled spreaders are used, but drivers are trained to turn off the spreader at stops.

The city uses little pesticides, only for weeds on the street. MR produced a wallet card for his pesticide license.

Maintenance of park lawns is a contract; MR stated the contract supervisor was not available this day.

The City owns a golf course, run out of the Recreation Department, and the school grounds are maintained by the School Department.

At this point, the group began an inspection of the DPW facility itself. The inspection report is attached as a separate document.

[Following the DPW yard tour, the original group re-convened at the City Engineers office for a short concluding session, then Mr. Spejewski left the facility].

EPA Region 1

Clean Water Act

Inspection Data Entry Form: 3560EZ

Inspector:	Erin Trainor	Date form completed:	7/1/2013
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Section A: Facility Information

Inspection start date:	6/27/2013	Inspection end date (if more than one day):	6/27/2013
NPDES ID:	MAR0141219	Federal facility?	No
Name and Location of Facility Inspected:			
Name:	City of Salem		
Address:	Enter text		
City:	Salem	State:	MA
ZIP:	01970		
Facility On-Site Representative #1:			
Name:	Rebecca Dupont-Coutu		
Title:	Assistant Engineer, New England Civil Engineering Corp. (consultant)		
Phone #:	9787417401	Fax # / email:	9787417402
Facility On-Site Representative #2 (if necessary):			
Name:	Enter text		
Title:	Enter text		
Phone #:	Enter text	Fax # / email:	Enter text

Section B: Compliance Monitoring Information

Clean Water Act Section (choose from only one of the following):

CWA §308[A][B]: NPDES	Stormwater - MS4
CWA §311: Oil and Hazardous Substances	Choose an item
CWA §404: Permits for Dredge and Fill Material	Choose an item
Compliance Monitoring Type:	Inspection w/ Sampling
Compliance Monitoring Reason:	Agency Priority
If Agency Priority, then specify priority(s):	
OECA - CAFO	<input type="checkbox"/>
OECA - CAFO Region Initiative Areas	<input type="checkbox"/>
OECA - CSOs w/ < 50,000 service population	<input type="checkbox"/>
OECA - CSOs w/ >= 50,000 service population	<input type="checkbox"/>
OECA - MS4s Phase I	<input type="checkbox"/>
OECA - MS4s Phase II	<input checked="" type="checkbox"/>
Region 1 - Environmental Justice	<input type="checkbox"/>
Region 1 - Green Economy / Green Infrastructure	<input type="checkbox"/>
Region 1 - Industrial Laundries	<input type="checkbox"/>
Region 1 - Lead Poisoning	<input type="checkbox"/>
Region 1 - Municipal Infrastructure	<input type="checkbox"/>
Region 1 - Pollution Prevention & Resource Conservation	<input type="checkbox"/>

Region 1 - Ship / Boat Yards		<input type="checkbox"/>
Region 1 - Wet Weather		<input type="checkbox"/>
Compliance Monitoring Agency Type:		EPA
Was this a Joint Compliance Monitoring Activity?		No
Which party had the lead?		Choose an item or leave blank if N/A
If State lead, what was the purpose of EPA participation?		Choose an item or leave blank if N/A

Section C: ICDS Information		
Did you observe deficiencies (potential violations) during the inspection?		Yes
Potential excess emission in violation of regulations:		<input type="checkbox"/>
Potential failure to... ... complete or submit a notification, report, certification, or manifest:		<input type="checkbox"/>
... follow a permit condition(s):		<input type="checkbox"/>
... follow a required sample monitoring procedure or laboratory procedure:		<input type="checkbox"/>
... follow or develop a required management practice or procedure:		<input type="checkbox"/>
... identify and manage a regulated waste or pollutant in any media:		<input checked="" type="checkbox"/>
... maintain a record or failure to disclose a document:		<input type="checkbox"/>
... maintain/inspect/repair meters, sensors, and recording equipment:		<input type="checkbox"/>
... obtain a permit, product approval, or certification:		<input type="checkbox"/>
... report regulated events such as spills, accidents, etc.:		<input type="checkbox"/>
Potential incorrect use of a material (pesticide, waste, product) or use of an unapproved material:		<input type="checkbox"/>
Potential violation of a compliance schedule in an enforceable order:		<input type="checkbox"/>
If you observed deficiencies, did you communicate the deficiencies to the Facility during the inspection?		No
If yes, did you observe the Facility take any actions during the inspection to address the deficiencies noted?		No
If yes, what actions were taken?	Choose an item	
If the Facility reduced pollution, what pollutant was reduced?	Enter text	
Did you provide general compliance assistance in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?		No
Did you provide site-specific compliance assistance in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?		No

Comments:
Enter text



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

DATE: July 30, 2013

SUBJ: MS4 Compliance Sampling Inspection
City of Salem, Massachusetts

FROM: Erin Trainor, Inspector

TO: File

REQUESTED BY: Andrew Spejewski

I. Background Information

- A. Date, Time of inspection: Thursday, June 27, 2013, 7:30 AM
- B. Weather Conditions: Overcast, approximately 65 degrees F
- C. USEPA Representatives: Erin Trainor
Andrew Spejewski
- D. Site Representative(s): David Knowlton, P.E.
City Engineer, City of Salem
120 Washington Street, 4th Floor
Salem, MA 01970

Note: The Site Representative was not on site at the time of the inspection; however the following representatives were on site.

- On-Site Representative(s): Giovanna Zabaleta
Junior Engineer, City of Salem
120 Washington Street, 4th Floor
Salem, MA 01970
- Rebecca Dupont-Coutu
Assistant Engineer, New England Civil Engineering Corp.
120 Washington Street, Suite 202E
Salem, MA 01970
- E. Address: Various locations along the North River, Salem Harbor, and
Salem Sound.

II. Purpose of Inspection

The purpose of the inspection was to identify illicit connections or illegal discharges within the City of Salem municipal separate stormwater sewer system (MS4) that may adversely impact the water quality. The City of Salem has been issued permit number MAR041219. Samples were collected from thirteen stormwater outfalls and/or manholes in accordance with the Environmental Investigations and Analysis (EIA) unit Stormwater Program Plan.

III. Description of Sample Locations

- Outfall located at the end of Juniper Ave., along Beach Ave., identified as Outfall76.
- Manhole upstream of Outfall76, located along Beach Ave., identified as MH4378.
- Manhole upstream of Outfall76, located along Juniper Ave., identified as MH4375.
- Outfall located along Derby Street west of s/v Friendship, identified as Outfall01.
- Manhole upstream of Outfall01, located along Derby Street, identified at MH154.
- Outfall within MH154, identified as MH154a.
- Manhole upstream of Outfall140, located along Mason Street and drains the Mason Street (north of the manhole) and North Street neighborhoods, identified as MH5696A.
- Manhole upstream of Outfall140, located along Mason Street and drains the Buffum Street neighborhood, identified as MH5696B.
- Manhole upstream of Outfall138, located on Dunlap Street and runs southwest along Devereaux Street, identified as MH4448.
- Manhole upstream of Outfall138 and north of MH4448, and runs northwest along Dunlap Street, identified as MH4449.
- Outfall located along Commercial Street and discharges into the North River, identified as Outfall138.
- Outfall located along Commercial Street, northeast of Outfall138 and discharges into the North River, identified as Outfall140.
- Manhole located along Pioneer Terrace, identified as MH3516.

IV. Inspection Observations and Findings

On Thursday, June 27, 2013, EPA inspectors Andrew Spejewski and Erin Trainor conducted a Compliance Sampling Inspection (CSI) within the City of Salem, Massachusetts at thirteen (13) locations throughout the City.

The inspection started in Salem at approximately 7:30 AM. At the time of the inspection, the weather was overcast and approximately 65 degrees Fahrenheit. According to weather underground (www.weatherunderground.com), 0.82 inches of rain was reported on June 26, 2013.

The sampling locations described in Section III were field screened using test kits for ammonia, chlorine, and surfactants and analyzed at the EPA New England Regional Laboratory (NERL) for E.Coli, Enterococcus, and pharmaceutical and personal care products (PPCPs) including: Atenolol, Acetaminophen, Cotinine, 1,7-Dimethylxanthine, Caffeine, Carbamazepine, and Metoprolol. In-situ measurements for conductivity, salinity, and temperature were also recorded.

The following table summarizes the findings. Laboratory results are anticipated to be available July 2013. Photographs are included.

End of Report

Attachments: Table 1: Summary of Salem, MA MS4 Inspection – June 27, 2013

Photographs

Table 1: Summary of Salem, MA MS4 Inspection – June 27, 2013

Sample ID	Outfall76	MH4378	MH4375	Outfall01	MH154	MH154a	MH5696a
Time	08:00	08:15	08:30	09:15	09:30	09:40	10:05
Latitude/Longitude	42.53424139 N / 70.86584411 W	42.53370654 N / 70.86592301 W	42.53379786 N / 70.86702364 W	42.52109437 N / 70.88711704 W	42.52133268 N / 70.88711278 W	42.52133268 N / 70.88711278 W	42.52565937 N / 70.90179439 W
Description of Location	Outfall located at the end of Juniper Ave., along Beach Ave.	Manhole upstream of Outfall76, located along Beach Ave.	Manhole upstream of Outfall76, located along Juniper Ave.	Outfall located along Derby Street west of s/v Friendship.	Manhole upstream of Outfall01, located along Derby Street.	Outfall within MH154.	Manhole upstream of Outfall140, located along Mason Street and drains the Mason Street and North Street neighborhoods.
Physical Observations	Flow approx. 10 GPM	Flow approx 5 GPM	Flow approx 5 GPM	Flow approx 30 GPM	Low flow, in situ measurements were collected from pool beneath outfall	Reportedly drains a chamber containing groundwater.	Flow < 1 GPM
Temperature, °C	17.8	19.1	16.9	16.9	16.8	NA	17.2
Specific Conductivity, µS	15.97 (mS)	9.20 (mS)	2,869	25.0 (mS)	18.01 (mS)	NA	1,167
Salinity, ppt	9.5	0.1	1.5	16.1	10.7	NA	0.1
Ammonia, mg/L	0.5	0	0	0.5	0	NA	0.25
Total Residual Chlorine, mg/L	0.05	0.01	0.00	0.05	0.04	NA	0.02
Surfactants, mg/L	NA	0.75	NA	NA	NA	NA	0.25
1,7 - Dimethylxanthine	120	43	2.0	2.4	4.9	6.4	25
Acetaminophen, ng/L	230	32	0.94	ND	0.74	ND	19
Atenolol, ng/L	15	7.5	ND	ND	ND	ND	ND
Caffeine, ng/L	420	130	25	33	100	42	1,600
Carbamazepine, ng/L	1.7	4.8	ND	ND	0.28	ND	ND
Cotinine, ng/L	25	17	1.1	2.3	7.0	2.8	51
Metoprolol, ng/L	7.4	9.4	ND	ND	ND	ND	ND
E.Coli, MPN	2,069	241	225	2,318	1,741	5,199	621
Enterococcus, MPN	684	1,081	364	1,246	154	1,334	1,178

NA: Not analyzed due to high salinity readings, low flows, and/or constraints on time

ND: Not detected above reporting limit

Table 1: Summary of Salem, MA MS4 Inspection – June 27, 2013

Sample ID	MH5696b	MH4448	MH4449	Outfall138	Outfall140	MH3516
Time	10:25	10:55	11:10	11:45	12:00	12:35
Latitude/Longitude	42.52565937 N / 70.90179439 W	42.52590121 N / 70.90625592 W	42.52594518 N / 70.90619359	42.52355723 N / 70.902895 W	42.52443019 N / 70.90058451 W	42.51314289 N / 70.88893123 W
Description of Location	Manhole upstream of Outfall140, located along Mason Street and drains the Buffum Street neighborhood.	Manhole upstream of Outfall138, located on Dunlap Street and runs southwest along Devereaux Street.	Manhole upstream of Outfall138 and north of MH4448, and runs northwest along Dunlap Street.	Outfall located along Commercial Street and discharges into the North River.	Outfall located along Commercial Street, northeast of Outfall138 and discharges into the North River.	Manhole located along Pioneer Terrace.
Physical Observations	Flow < 1 GPM	Reportedly drains wetland area.	Flow approx 50 GPM	Partially submerged.	3:04 hours after low tide.	3:39 hours after low tide.
Temperature, °C	17.2	NA	NA	16.3	18.5	16.8
Specific Conductivity, µS	1,167	NA	NA	6.0 (mS)	8.94 (mS)	29.3 (mS)
Salinity, ppt	0.1	NA	NA	3.2	4.9	18.2
Ammonia, mg/L	1.0	6	0	0	0	NA
Total Residual Chlorine, mg/L	0.02	0.05	0.01	0.02	0.02	NA
Surfactants, mg/L	0.20	0.25	0.25	NA	NA	NA
1,7 - Dimethylxanthine	6.6	460	2.1	17	3.2	55
Acetaminophen, ng/L	ND	12,000	ND	13	ND	240
Atenolol, ng/L	ND	ND	ND	ND	ND	32
Caffeine, ng/L	250	2,100	21	110	73	260
Carbamazepine, ng/L	ND	ND	1.2	1.6	0.42	4.6
Cotinine, ng/L	1.7	16	0.9	1.2	2.6	11
Metoprolol, ng/L	ND	2,800	ND	5.6	ND	36
E.Coli, MPN	1,844	9,678	25	192	297	3,683
Enterococcus, MPN	122	5,172	86	259	538	3,873

NA: Not analyzed due to high salinity readings, low flows, and/or constraints on time

ND: Not detected above reporting limit



Outfall76: Outfall located at the end of Juniper Ave., along Beach Ave.



MH4378: Manhole upstream of Outfall76, located along Beach Ave.



MH4375: Manhole upstream of Outfall76, located along Juniper Ave.



Outfall01: Outfall located along Derby Street west of s/v Friendship.



MH154/MH154a: Manhole upstream of Outfall01, located along Derby Street.



MH5696a/MH5696b: Manhole upstream of Outfall1140, located along Mason Street.



MH4448: Manhole upstream of Outfall138, located on Dunlap Street and runs southwest along Devereaux Street.



Outfall138: Outfall located along Commercial Street and discharges into the North River.



Outfall140: Outfall located along Commercial Street, northeast of Outfall138 and discharges into the North River.



MH3516: Manhole located along Pioneer Terrace.



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Laboratory Report

November 13, 2012

Erin Trainor - EIA / OEME
US EPA New England R1

Project Number: 12100011
Project: Rhode Island Beaches
Analysis: HPLC/MS/MS Source Tracking Analysis
Analyst: Peter Philbrook

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIA-LCMS_STA.0.

The SOP is based on an EPA Regional Analytical Method developed at the EPA New England Laboratory.

Date Samples Received by the Laboratory: 10/10/2012

Data were reviewed in accordance with the internal verification procedures described in the EPA New England OEME Chemistry QA Plan.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Dan Boudreau
DN: cn=Dan Boudreau, o=EPA,
ou=EIA,
email=boudreau.dan@epa.gov,
c=US
Date: 2012.11.13 13:45:23 -05'00'

12100011\$STA

Qualifiers

RL = Reporting limit

ND = Not Detected above Reporting limit

NA = Not Applicable due to high sample dilutions or sample interferences

J = Estimated value

E = Estimated value exceeds the calibration range

L = Estimated value is below the calibration range

B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.

P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.

C = The identification has been confirmed by GC/MS.

R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Rhode Island Beaches

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: SB01
Date of Collection: 10/10/2012
Date of Extraction: 10/11/12
Date of Analysis: 10/31/12
Volume Extracted: 500 mL

Lab Sample ID: AB34186
Matrix: Water
Final Volume: 1 mL
pH: 7.62
Extract Dilution: 1

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
29122-68-7	Atenolol	0.99	2.0	L
103-90-2	Acetaminophen	0.53	2.0	L
486-56-6	Cotinine	1.3	0.40	
611-59-6	1,7-Dimethylxanthine	0.92	2.0	L
58-08-2	Caffeine	4.43	4.0	B
298-46-4	Carbamazepine	0.86	0.40	
56392-17-7	Metoprolol	0.61	2.0	L

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	66	23 - 181
Sulfamethazine 13C6	28	15 - 132

Comments: B = Caffeine was detected in the blank, value could be associated with blank contamination.

L = Estimated value is below the calibration range.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Rhode Island Beaches

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: SB02
Date of Collection: 10/10/2012
Date of Extraction: 10/11/12
Date of Analysis: 10/31/12
Volume Extracted: 500 mL

Lab Sample ID: AB34187
Matrix: Water
Final Volume: 1 mL
pH: 7.08
Extract Dilution: 10

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
29122-68-7	Atenolol	ND	20.0	
103-90-2	Acetaminophen	260	20.0	
486-56-6	Cotinine	96	4.00	
611-59-6	1,7-Dimethylxanthine	450	20.0	
58-08-2	Caffeine	1500	40.0	
298-46-4	Carbamazepine	ND	4.00	
56392-17-7	Metoprolol	ND	20.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	62	23 - 181
Sulfamethazine 13C6	108	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Rhode Island Beaches

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: SB03
Date of Collection: 10/10/2012
Date of Extraction: 10/11/12
Date of Analysis: 10/31/12
Volume Extracted: 500 mL

Lab Sample ID: AB34188
Matrix: Water
Final Volume: 1 mL
pH: 7.34
Extract Dilution: 2

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
29122-68-7	Atenolol	ND	4.00	
103-90-2	Acetaminophen	15	4.00	
486-56-6	Cotinine	62	0.80	
611-59-6	1,7-Dimethylxanthine	49	4.00	
58-08-2	Caffeine	400	8.00	
298-46-4	Carbamazepine	ND	0.80	
56392-17-7	Metoprolol	ND	4.00	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	70	23 - 181
Sulfamethazine 13C6	110	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Rhode Island Beaches

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: SB09
Date of Collection: 10/10/2012
Date of Extraction: 10/11/12
Date of Analysis: 10/31/12
Volume Extracted: 500 mL

Lab Sample ID: AB34189
Matrix: Water
Final Volume: 1 mL
pH: 6.97
Extract Dilution: 1 & 5

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
29122-68-7	Atenolol	ND	2.0	
103-90-2	Acetaminophen	13	2.0	
486-56-6	Cotinine	26	2.00	
611-59-6	1,7-Dimethylxanthine	94	10.0	
58-08-2	Caffeine	920	20.0	
298-46-4	Carbamazepine	ND	2.00	
56392-17-7	Metoprolol	ND	10.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	52	23 - 181
Sulfamethazine 13C6	34	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Rhode Island Beaches

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: SB04
Date of Collection: 10/10/2012
Date of Extraction: 10/11/12
Date of Analysis: 10/31/12
Volume Extracted: 500 mL

Lab Sample ID: AB34190
Matrix: Water
Final Volume: 1 mL
pH: 6.95
Extract Dilution: 2

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
29122-68-7	Atenolol	ND	4.00	
103-90-2	Acetaminophen	13	4.00	
486-56-6	Cotinine	12	0.80	
611-59-6	1,7-Dimethylxanthine	11	4.00	
58-08-2	Caffeine	310	8.00	
298-46-4	Carbamazepine	ND	0.80	
56392-17-7	Metoprolol	ND	4.00	

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	62	23 - 181
Sulfamethazine 13C6	110	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Rhode Island Beaches

HPLC/MS/MS Source Tracking Analysis

Client Sample ID: SB05
Date of Collection: 10/10/2012
Date of Extraction: 10/11/12
Date of Analysis: 10/31/12
Volume Extracted: 500 mL

Lab Sample ID: AB34191
Matrix: Water
Final Volume: 1 mL
pH: 7.49
Extract Dilution: 2

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
29122-68-7	Atenolol	ND	4.00	
103-90-2	Acetaminophen	14	4.00	
486-56-6	Cotinine	10	0.80	
611-59-6	1,7-Dimethylxanthine	62	4.00	
58-08-2	Caffeine	200	8.00	
298-46-4	Carbamazepine	ND	0.80	
56392-17-7	Metoprolol	2.0	4.00	L

Surrogate Compounds	Recoveries (%)	QC Ranges
Primidone d5	68	23 - 181
Sulfamethazine 13C6	63	15 - 132

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Rhode Island Beaches

Laboratory Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Extraction: 10/11/12
Date of Analysis: 10/31/12
Volume Extracted: 500 mL

Lab Sample ID: N/A
Matrix: Water
Final Volume: 1 mL
pH: 6.96
Extract Dilution: 1

CAS Number	Compound	Concentration ng/L	RL ng/L	Qualifier
29122-68-7	Atenolol	ND	2.0	
103-90-2	Acetaminophen	ND	2.0	
486-56-6	Cotinine	ND	0.40	
611-59-6	1,7-Dimethylxanthine	ND	2.0	
58-08-2	Caffeine	7.4	4.0	
298-46-4	Carbamazepine	ND	0.40	
56392-17-7	Metoprolol	ND	2.0	

Surrogate Compounds

Sulfamethazine 13C6
Primidone d5

Recoveries (%)

77
92

QC Ranges

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

MATRIX SPIKE (MS)

Rhode Island Beaches

Sample ID: AB34191

PARAMETER	SPIKE ADDED ng/L	SAMPLE CONCENTRATION ng/L	MS CONCENTRATION ng/L	MS % REC	QC LIMITS (% REC)
1,7-Dimethylxanthine	144	76	234	110	13 - 174
Acetaminophen	144	17	147	90	23 - 138
Atenolol	144	ND	108	75	49 - 137
Caffeine	288	250	499	87	31 - 156
Carbamazepine	29	ND	25.4	88	47 - 143
Cotinine	29	13	41	97	46 - 121
Metoprolol	144	2.4	199	137	60 - 140

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Laboratory Duplicate Results

Rhode Island Beaches

Sample ID: AB34186

PARAMETER	SAMPLE RESULT ng/L	SAMPLE DUPLICATE RESULT ng/L	PRECISION RPD %	QC LIMITS
1,7-Dimethylxanthine	1.2	2.0	50.0	50
Acetaminophen	0.67	0.90	29.3	50
Atenolol	1.2	0.91	27.5	50
Caffeine	5.5	7.2	26.8	50
Carbamazepine	1.1	1.5	30.8	50
Cotinine	1.6	2.0	22.2	50
Metoprolol	0.76	0.70	8.22	50

Comments: Sample/Sample Duplicate Higher RPDs were observed due to reporting compounds near or below the Reporting Limit.

Laboratory Fortified Blank (LFB) Results

Rhode Island Beaches

PARAMETER	LFB AMOUNT SPIKED ng/L	LFB RESULT ng/L	LFB RECOVERY %	QC LIMITS %
1,7-Dimethylxanthine	120	107	89	64 - 135
Acetaminophen	120	73.5	61	48 - 122
Atenolol	120	101	84	52 - 128
Caffeine	240	204	85	68 - 126
Carbamazepine	24	21.0	88	65 - 121
Cotinine	24	21.3	89	60 - 120
Metoprolol	120	99.5	83	60 - 140

Comments:



ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

[illegible]

5-4-06



United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code 1 <u>W</u> 2 <u>5</u> 3 <u>MAR0411082</u> 11 12 <u>090728</u> 17 18 <u>K</u> 19 <u>R</u> 20 <u>1</u>	NPDES yr/mo/day	Inspection Type	Inspector	Fac Type
Remarks 21 <u>Site clean water in MS4 sampling log</u>				
Inspection Work Days 67 <u>0</u> 69	Facility Self-Monitoring Evaluation Rating 70 <u>1</u>	BI 71 <u>1</u>	QA 72 <u>1</u>	Reserved 73 <u>1</u> 74 <u>1</u> 75 <u>1</u> 76 <u>1</u> 77 <u>1</u> 78 <u>1</u> 79 <u>1</u> 80 <u>1</u>

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) <u>City of Somerville, Massachusetts</u> <u>93 Highland Avenue</u> <u>Somerville, MA 02143</u>	Entry Time/Date <u>1100 7/28/09</u>	Permit Effective Date <u>May 2003</u>
	Exit Time/Date <u>1130 7/28/09</u>	Permit Expiration Date <u>May 2008</u>
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s) <u></u>	Other Facility Data (e.g., SIC NAICS, and other descriptive information)	
Name, Address of Responsible Official/Title/Phone and Fax Number <u>Charles O'Brien, City Engineer</u> <u>617-625-6600 x 5410</u>		
Contacted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/> Permit	<input type="checkbox"/> Self-Monitoring Program	<input type="checkbox"/> Pretreatment	<input type="checkbox"/> MS4
<input type="checkbox"/> Records/Reports	<input type="checkbox"/> Compliance Schedules	<input type="checkbox"/> Pollution Prevention	
<input type="checkbox"/> Facility Site Review	<input type="checkbox"/> Laboratory	<input checked="" type="checkbox"/> Storm Water	
<input type="checkbox"/> Effluent/Receiving Waters	<input type="checkbox"/> Operations & Maintenance	<input type="checkbox"/> Combined Sewer Overflow	
<input type="checkbox"/> Flow Measurement	<input type="checkbox"/> Sludge Handling/Disposal	<input type="checkbox"/> Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	SEV Description _____
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	_____
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	_____
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	_____

Name(s) and Signature(s) of Inspector(s) <u>Todd Boni</u>	Agency/Office/Phone and Fax Numbers <u>USEPA RI 617-918-1358</u>	Date <u>8/10/09</u>
Signature of Management Q A Reviewer	Agency/Office/Phone and Fax Numbers	Date



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 12 July 2011

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
City of Somerville, MA

From: Todd Borci

To: File

On Wednesday, 22 June 2011, EPA inspector Todd Borci conducted a Compliance Sampling Inspection (CSI) of the City of Somerville, Massachusetts's (the "City") Municipal Separate Storm Sewer System ("MS4"). EPA collected water quality samples from one stormwater outfall located along the west bank of the Mystic River, just south of the Amelia Earhart Dam. The outfall is known as "MWRA 205" as the outfall not only conveys stormwater base flow from the City of Somerville, MA, but also serves as a Combined Sewer Overflow ("CSO") discharge point for the Metropolitan Water Resources Authority ("MWRA"). Weather had been free of any significant precipitation in the 72 hours leading up to sampling; however, EPA will verify the date of the last CSO activation to consider with the sample results.

At 1033 hours EPA sampled an approximately 60-inch diameter outfall (sample id "MWRA205") located approximately 100 feet south of the Amelia Earhart Dam. The outfall was sampled on the outgoing tide, as high tide was expected at approximately 1049 hours. EPA noted a steady cloudy, murky discharge with a significant amount of fine suspended material from the outfall, with approximately 2 feet from surface of the water to the bottom of the outfall.

EPA notes sampling likely occurred during an astronomically higher than average tidal cycle based on past observations this close to low tide at this outfall. Using Hach brand test strips for ammonia and a Chemetrics K-9400 field kit for surfactants, EPA processed a surface water sample collected at the location. Field kits indicated detectable levels of ammonia (0.25 mg/l) and surfactants (2.0 mg/l) in the sample. EPA notes the elevated surfactant level was likely due in part to the elevated salinity (24.29 parts per thousand) of the water discharging from the outfall. EPA personnel typically use 0.5 mg/l ammonia and 0.25 mg/l surfactants as threshold level screening concentrations, where sample results equal to or greater than these concentrations may be indicative of illicit discharges. A sample was collected and sent back to the EPA laboratory to be analyzed for e. coli and enterococcus bacteria, and selected pharmaceutical compounds.

Once received from EPA laboratory, the analytical data for this sampling effort will be attached to this report.

Inspection ended at 1050 hours. EPA will coordinate follow up actions with the City of Somerville, MassDEP, and MWRA as appropriate.



Photo 1: 6/22/11 1033 View of “MWRA205” sample location. Note cloudy, murky flow with suspended material in discharge.



EPA Region 1 Clean Water Act Inspection Data Entry Form: 3560EZ

Version 1.02

Inspector:	Andrew Spejewski	Date form completed:	7/31/2015
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Section A: Facility Information

Inspection start date:	8/1/2013	Inspection start time:	10:30 AM
Inspection end date (if more than one day):	8/2/2013	Inspection finish time:	2:30 pm
NPDES ID:	MAR041023	Federal facility?	Choose an item
Name and Location of Facility Inspected:			

Name:	City of Springfield MS4				
Address:	70 Tapley St				
City:	Springfield	State:	MA	ZIP:	01104

Facility Representative #1:

Name:	N/A [recon]	Title:	Enter text		
Address (if off-site):	Enter text				
City:	Enter text	State:	Enter text	ZIP:	Enter text
Phone #:	Enter text	Email:	Enter text		

Facility Representative #2 (if necessary):

Name:	Enter text	Title:	Enter text		
Address (if off-site):	Enter text				
City:	Enter text	State:	Enter text	ZIP:	Enter text
Phone #:	Enter text	Email:	Enter text		

Section B: Compliance Monitoring Information

Clean Water Act Section (choose from only one of the following):

CWA §308[A][B]: NPDES	Stormwater - MS4
CWA §311: Oil and Hazardous Substances	Choose an item
CWA §404: Permits for Dredge and Fill Material	Choose an item

Compliance Monitoring Type:	Reconnaissance
Compliance Monitoring Reason:	Agency Priority

If Agency Priority, then specify priority(s):

OECA - CAFO	<input type="checkbox"/>
OECA - CAFO Region Initiative Areas	<input type="checkbox"/>
OECA - CSOs w/ < 50,000 service population	<input type="checkbox"/>
OECA - CSOs w/ >= 50,000 service population	<input type="checkbox"/>
OECA - MS4s Phase I	<input type="checkbox"/>
OECA - MS4s Phase II	<input checked="" type="checkbox"/>

OECA - SSOs ≥ 10 MGD and < 100 MGD	<input type="checkbox"/>
Region 1 - Environmental Justice	<input checked="" type="checkbox"/>
Region 1 - Green Economy / Green Infrastructure	<input type="checkbox"/>
Region 1 - Industrial Laundries	<input type="checkbox"/>
Region 1 - Lead Poisoning	<input type="checkbox"/>
Region 1 - Municipal Infrastructure	<input type="checkbox"/>
Region 1 - Pollution Prevention & Resource Conservation	<input type="checkbox"/>
Region 1 - Ship / Boat Yards	<input type="checkbox"/>
Region 1 - Wet Weather	<input checked="" type="checkbox"/>

Compliance Monitoring Agency Type:	EPA
Was this a Joint Compliance Monitoring Activity?	No
If Joint, which party had the lead?	Choose an item or leave blank if N/A
If State lead, what was the purpose of EPA participation?	Choose an item or leave blank if N/A

Section C: ICDS Information	
Did you observe deficiencies (potential violations) during the inspection?	Choose an item
Potential excess emission in violation of regulations:	<input type="checkbox"/>
Potential failure to... ... complete or submit a notification, report, certification, or manifest:	<input checked="" type="checkbox"/>
... follow a permit condition(s):	<input checked="" type="checkbox"/>
... follow a required sample monitoring procedure or laboratory procedure:	<input type="checkbox"/>
... follow or develop a required management practice or procedure:	<input type="checkbox"/>
... identify and manage a regulated waste or pollutant in any media:	<input type="checkbox"/>
... maintain a record or failure to disclose a document:	<input type="checkbox"/>
... maintain/inspect/repair meters, sensors, and recording equipment:	<input type="checkbox"/>
... obtain a permit, product approval, or certification:	<input type="checkbox"/>
... report regulated events such as spills, accidents, etc.:	<input type="checkbox"/>
Potential incorrect use of a material (pesticide, waste, product) or use of an unapproved material:	<input type="checkbox"/>
Potential violation of a compliance schedule in an enforceable order:	<input type="checkbox"/>
If you observed deficiencies, did you communicate the deficiencies to the Facility during the inspection?	Choose an item
If yes, did you observe the Facility take any actions during the inspection to address the deficiencies noted?	Choose an item
If yes, what actions were taken?	Choose an item
If the Facility reduced pollution, what pollutant was reduced?	Enter text
Did you provide <i>general compliance assistance</i> in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?	Choose an item
Did you provide <i>site-specific compliance assistance</i> in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?	Choose an item

Comments:
Enter text

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

[illegible]

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) Seven outfalls within the Town of Springfield, Massachusetts	Entry Time/Date 9:00AM 5/8/2013	Permit Effective Date
	Exit Time/Date 13:15PM 5/8/2013	Permit Expiration Date
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s) No contact with the City of Springfield was made during this sampling inspection.	Other Facility Data: Receiving Water: Connecticut River	
Name, Address of responsible Official/Title/Phone and Fax Number. William E. Leonard, Carmen E. Serrano-Gerena and Daniel Rodriguez, Commissioners Springfield Water and Sewer Commission Phone: 413-787-6256 ext 111	Contacted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/>	Permit	<input type="checkbox"/>	Self-Monitoring Program	<input type="checkbox"/>	Pretreatment	<input checked="" type="checkbox"/>	MS4
<input type="checkbox"/>	Records/Reports	<input type="checkbox"/>	Compliance Schedules	<input type="checkbox"/>	Pollution Prevention		
<input type="checkbox"/>	Facility Site Review	<input type="checkbox"/>	Laboratory	<input checked="" type="checkbox"/>	Storm Water		
<input checked="" type="checkbox"/>	Effluent/Receiving Waters	<input type="checkbox"/>	Operations & Maintenance	<input checked="" type="checkbox"/>	Combined Sewer Overflow		
<input type="checkbox"/>	Flow Measurement	<input type="checkbox"/>	Sludge Handling/Disposal	<input type="checkbox"/>	Sanitary Sewer Overflow		

Section D: Summary of Findings/Comments (Attach additional sheets of narrative and checklists as necessary)

SEV Codes					SEV Description
Name(s) and Signature(s) of Inspector(s) Erin F. Trainor					Agency/Office/Phone and Fax Numbers US EPA / EIA / p. (617) 918-8382 / f. (617) 918-8282
Signature of Management QA Reviewer					Agency/Office/Phone and Fax Numbers
					Date



**United States Environmental Protection Agency
Region I - EPA New England
5 Post Office Square
Boston, MA 02109-3912**

Confidential/FOIA Exempt/Attorney Client Privilege

Subj: Inspection Field Notes
City of Springfield MS4

From: Andrew Spejewski

Drafted Date: Aug 16, 2013

Finalized Date:

Reviewed By:

Reviewed Date:

To: File

I. Facility Information

A. Facility Name: City of Springfield MS4

B. Facility Location: 70 Tapley St
Springfield, MA 01104

C. Facility Contacts: N/A [recon]

D. Permit Number: MAR041023

II. Background Information

A. Date and time of inspection:
Facility entrance: August 1, 2013, 10:30 AM
Facility exit: August 2, 2013, 2:30 pm

B. Weather Conditions: Aug 1: cloudy, rain after 1:30pm
Aug 2: clear and dry

C. US EPA Representative(s): Andrew Spejewski

D. State/Local Representative(s): None

E. Previous Enforcement Actions: None

III Type and Purpose of Inspection

Reconnaissance to examine the City of Springfield's MS4 outfalls; looking for evidence of illicit connections and/or outfalls not properly screened.

IV Facility Description

The City of Springfield has an extensive separate storm sewer system (MS4). Portions of the city are also still combined (these portions are managed not by the City but by the Springfield Water and Sewer Commission).

The City has an MS4 general permit, still active.

V. Inspection

Aug 1:

Mr. Spejewski arrived in Springfield at about 10:00 AM. Weather was cloudy but dry until about 1:30, when light occasional rain began. Rain gradually became steady over the next hour until observations stopped for the day; at that point roads were wet, but there was no real water running off of them.

Mr. Spejewski drove to various locations in the City, parking on public roads and finding outfalls on foot.

Outfalls 77 and 76 (north and east of Indian Leap St) could not be located.

Outfall 172 (N of Water St at Cedar St) was a square brick-walled culvert. No flow.

Outfall 296 (N of Water St at Pinevale) was a large (perhaps 24") concrete pipe, with a small (perhaps 3") PVC pipe discharging about 5 feet below the concrete outlet. There was flow from both pipes. A sign was posted above the outfall (facing the road), indicating that this was City of Springfield CSO outlet #36.

Outfall 48 (N of Water St at Oak St): Was a large concrete pipe, trickle to minor flow.

North and East of Bircham St, South of Worcester St (rt 141), a streambed ran north from an outfall about 40 yards to a culvert inlet (apparently heading north under Worcester St). The outfall to the south (possibly outfall 112 or 307) had a trickle of flow. Two small outfall holes (possibly #305) were present in the concrete wall of the culvert inlet, discharging to the area just upstream of the inlet. These were both dry.

Outfall 306 (W of Bircham St, S of Worcester St) discharged to a dry streambed running west. The outfall was barely wet, not even quite a trickle of discharge.

Grochmal Avenue: Catchbasins were observed on Grochmal across from mobile home park, and near pump station at end of Grochmal. [There is no outfall nearby downstream of Grochmal on the City map]

Outfall 89 (N of Cottage St, W of Robbins) could not be located. The terrain seemed to indicate a streambed flowing north in this area, but it could not be located through vegetation.

Outfall 228 (E of Industry Drive (Robbins), S of Cottage) could not be located. A stream flows north to Cottage in this area, in a ravine well below the height of Cottage st and the surrounding terrain.

Outfall 228 (E of parking lot lying east of Industry Drive) could not be located.

Outfall 90 (NE of parking lot E of Industry at Memorial Drive): The outfall was mostly submerged in the flowing stream. However suds and a visible cloudy sheen could be clearly seen exiting the outfall and moving into the flow of the stream.

On Riverton road, the catchbasin on the north side of Riverton Road, just west of Laurelton, was again observed to have standing water with no flow, with sudden heavy flow into the catchbasin basin, flow ceasing within a minute.

Outfall 222 (S of Riverton Road at Laurelton): Outfall is partially submerged in a pool, but the outfall is the source of the stream, and flow leaving the pool downstream indicated flow was coming from outfall.

Outfall 223 (S of Riverton Road at Denver St): Small amount of flow coming from outfall (forming very small stream going S).

Outfall 188 (south of Grayson at Wallaston) – moderate flowing water, appeared clear.

Outfall 187 (south of Grayson at Slater) -- standing water was present below the outfall, but no flow away from pool was observed.

Outfall 186 (South of Grayson at Fox): The outfall was mostly submerged into large pool, with a stream flowing away from pool. On the north side of road (opposite outfall), standing water was present. The terrain suggests a stream flowing down from the north, through a culvert under Grayson.

Outfall 159 (XXXX) – could not locate in vegetation.

East of Royal St (Outfall 100 or 99). Only one outfall was located in this area. Standing water below the outfall, but no flow away from the pool.

Outfall 31 (N of Sunrise Terrace at Maebeth St) : outfall dry: extensive scouring and undermining below outfall has caused end of pipe to fall and break off.

Outfall 30 (N of Sunrise Terrace at Catalpa) : Outfall dry. Extensively scoured out below outfall.

Outfall 101 (N of South Branch Parkway at Bridle Path) – outfall dry.

Outfall 198 (N of South Branch Parkway at Clearbrook Dr) – outfall dry but staining, possible bacterial film on bottom of pipe.

[Observations ceased for Aug 1 at this time, as rain continued]

On August 2, observations began about 9:00 am. Weather was clear and dry throughout the day.

Outfalls 249, 253 , and 241 could not be located, due to vegetation or lack of access.

Outfalls 250, 63, 121, 122, 238 all appeared to be located behind residences with no public access.

Outfall 252 (N of Mandalay)—Outfall was dry, in good shape.

West of Plumtree, just north of Allen (possibly outfall 3?) Outfall has been undermined and five feet of pipe has broken and fallen. Moderate trickle coming out of/underneath pipe (hard to see).

Outfall 215 (West of Holcomb). Outfall was submerged, but apparently flowing (leaves and debris were washed out of pipe into pool).

Outfall 46 (West of Dark Forest road). Two pipe outlets were present in one concrete structure; one to north was barely wet, south was trickle flowing.

South of Talmadge. Mr. Spejewski spoke to a resident in his front yard, who confirmed the outfall was there, and thought it only flowed it wet weather. The resident gave permission to look for it, but it could not be located in heavy vegetation and very swampy ground.

Outfall 686 (East of Pebble Mill Road). Outfall was submerged in small pool, but no outflow from pool.

Outfall 684 (East of Stony Brook Road) Outfall was submerged in moderate pool along a stream. It did not appear that there was flow from the outfall into the pool.

Outfall 131 could not be located; surmised to be slightly farther north than marked, at south end of Trail Circle (likewise 132)

Outfall 133 (West of Greentree Circle). The outfall was a large concrete beehive shaped structure. No signs of outflow.

Outfall 136 (West of south end of Ramblewood drive). Outfall is a large concrete structure. No signs of outflow.

Outfall 135 (south of Pine Needle Lane) Outfall was observed from a distance; it was at the bottom of a large retaining wall, in a private yard. It was a beehive concrete structure. A stream appeared to emit from the foot of the retaining wall, but access to the foot of the wall could not be obtained.

W of Memorial Drive (?Outfall 116) – Memorial drive ends at a landfill, with access to the south side blocked by the landfill fence. Ponds and wetlands could be seen to the south. To the north side, in a gully, a stream flowed.

Outfall 117 (N of cottage, W of Brookdale) could not be accessed from either the east or south due to fences.

After these observations, Mr. Spejewski concluded the inspection and left the City

Picture list:

20130801_102438.jpg	Outfall 172, north of Water St
20130801_102909.jpg	Outfall 296, north of water st at Pinevale St
20130801_102922.jpg	Small PVC pipe discharging from outfall 296
20130801_103026.jpg	‘CSO Outfall’ sign above outfall 296 (facing north from Water St)
20130801_103409.jpg	Outfall 48, north of west end of Water St
20130801_104308.jpg	Outfall northeast of Bircham St at Caldwell Drive (#112 or #307)
20130801_104315.jpg	Outfalls in concrete structure forming inlet of culvert going north under Rt 141 just east of Bircham St
20130801_104402.jpg	Outfall 306 West of Bircham St
20130801_112531.jpg	Outfall 90 – east of Industry Ave
20130801_120649.jpg	Outfall 222, south of Riverton at Laurelton
20130801_120654.jpg	Stream flowing from outfall 222
20130801_121028.jpg	Outfall 223, south of Riverton at Denver
20130801_121032.jpg	Second picture of outfall 223
20130801_122404.jpg	outfall 188, south of grayson at Wallaston
20130801_122811.jpg	outfall 187, south of Grayson at Slater
20130801_124451.jpg	Outfall 186 and pool south of Grayson at Fox
20130801_124454.jpg	Stream flowing from pool south of Grayson at Fox
20130801_125754.jpg	Outfall 100/99 East of Royal St
Pictures Aug 2:	
20130802_094841.jpg	Outfall 252 (N of Mandalay)
20130802_101012.jpg	West of Plumtree north of Allen
20130802_101050.jpg	Outfall west of Plumtree
20130802_101119.jpg	Close-up outfall west of Plumtree
20130802_103441.jpg	Outfall 215, West of Holcomb.
20130802_104520.jpg	West of Dark Forest road (outfall 46)
20130802_104528.jpg	Close-up south pipe, west of Dark Forest Road

20130802_104531.jpg	Outfall 46, west of Dark Forest Road
20130802_111855.jpg	Outfall 686 – East of Pebble Mill Road
20130802_112413.jpg	Outfall 684 --East of Stony Brook Road
20130802_115052.jpg	Outfall 133- West of Greentree Circle
20130802_115441.jpg	Outfall 136 --West of south end of Ramblewood drive Top
view	
20130802_115448.jpg	Side view outfall 136
20130802_115453.jpg	[Accidental exposure]
20130802_115659.jpg	Outfall 135/ south of Pine Needle Lane
20130802_115704.jpg	Second view, outfall 135
20130802_133405.jpg	Culvert at north end of Memorial Drive, at landfill
boundary	
20130802_133411.jpg	Culvert North of Memorial Drive



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

DATE: June 20, 2013

SUBJ: MS4 Compliance Sampling Inspection
City of Springfield, Massachusetts

FROM: Erin Trainor, Inspector

TO: File

REQUESTED BY: Andrew Spejewski

I. Background Information

- A. Date, Time of inspection: Wednesday, May 8, 2013, 9:30 AM
- B. Weather Conditions: Overcast, approximately 50 degrees F
- C. USEPA Representatives: Erin Trainor
Andrew Spejewski
- D. Site Representative(s): William Leonard, Carmen Serrano-Gerena, Daniel Rodriguez
Commissioners, City of Springfield
Springfield Water and Sewer Commission
250 M Street Extension, Agawam, MA 01001

Note: The Site Representative was not contacted during this inspection.

- E. Address: Various locations along Alden Brook, Watershops Pond, and
tributaries which eventually lead to the Connecticut River.

II. Purpose of Inspection

The purpose of the inspection was to identify illicit connections or illegal discharges within the City of Springfield municipal separate stormwater sewer system (MS4) that may adversely impact the water quality. The City of Springfield has been issued permit number MAR041023. Samples were collected from seven (7) stormwater outfalls and/or culverts in accordance with the Environmental Investigations and Analysis (EIA) unit Stormwater Program Plan.

III. Inspection Observations and Findings

On Wednesday May 8, 2013, EPA inspectors Andrew Spejewski and Erin Trainor conducted an unannounced Compliance Sampling Inspection (CSI) within the City of Springfield, Massachusetts at seven (7) locations throughout the City.

The inspection started in Springfield at approximately 9:30 AM. At the time of the inspection, the weather was overcast and approximately 50 degrees Fahrenheit. A heavy rain event lasting for approximately two minutes occurred during the inspection between 10:30 AM and 11:00 AM. Prior to that, there was no precipitation recorded within 72 hours of the inspection. Low to moderate flows were generally observed.

The sampling locations described in Section III were field screened using test kits for ammonia, chlorine, and surfactants and analyzed at the EPA New England Regional Laboratory (NERL) for E.Coli, Enterococcus, and pharmaceutical and personal care products (PPCPs) including: Atenolol, Acetaminophen, Cotinine, 1,7-Dimethylxanthine, Caffeine, Carbamazepine, and Metoprolol. In-situ measurements for conductivity, salinity, and temperature were also recorded. The following table summarizes the findings. Laboratory results are anticipated to be available June 2013. Photographs are included.

End of Report

Attachments: Table 1: Summary of Springfield, MA MS4 Inspection – May 8, 2013
Photographs

Table 1: Summary of Springfield, MA MS4 Inspection – May 8, 2013

Sample ID	Liberty N	Liberty S	258*	Alden W*	290	12	08
Time	09:30	09:35	10:20	11:00	11:30	1200	1310
Physical Observations	Moderate flow, turbid water, running water heard upstream.	Trickle. Sonde measurements collected from pool below outfall.	Turbid/cloudy water. Slight sewer odor.	Trickle. Suds present. A grey film-like substance lined the surface of the outfall pipe.	Low to moderate flow. Outfall partially submerged.		Duplicate sample collected.
Temperature, °C	13.1	12.4	14.4	NA	13.2	12.2	14.9
Specific Conductivity, µS	0.6	220	597	NA	596	269.3	169
Salinity, ppt	0.3	0.3	0.3	NA	0.3	0.1	0.1
Ammonia, mg/L	0	0	0	6	0	0	0
Total Residual Chlorine, mg/L	0.02	0.07	0.03	0.00	0.00	0.11	0.04
Surfactants, mg/L	<0.25 (0.10)	<0.25 (0.10)	<0.25 (0.10)	0.5	<0.25 (0.20)	<0.25 (0.10)	<0.25 (0.10)
1,7 - Dimethylxanthine	9.8	1.9	16	21000	5.9	3.5	4.2
Acetaminophen, ng/L	ND	ND	ND	22000	2.0	ND	27
Atenolol, ng/L	ND	ND	ND	ND	ND	ND	ND
Caffeine, ng/L	32	11	16	65000	18	8.7	14
Carbamazepine, ng/L	0.66	8.3	0.30	ND	1.1	ND	7.0
Cotinine, ng/L	2.3	4.2	2.0	270	2.2	3.3	2.1
Metoprolol, ng/L	1.3	ND	ND	340	ND	ND	1.1
E.Coli, MPN	87	ND	85	92,080	248	ND	241
Enterococcus, MPN	86	10	75	31,300	52	189	62

NA: Not analyzed

ND: Not detected above reporting limit

*A heavy rain event lasting for approximately two minutes occurred during the inspection between 258 and AldenW.



View of outfall designated LibertyN.



View of outfall designated LibertyS.



View of outfall designated No. 258.



View of outfall designated AldenW.



View of outfall designated No. 12.



View of outfall designated No. 08.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I

DATE: October 22, 2013

SUBJ: MS4 Compliance Sampling Inspection
City of Springfield, Massachusetts

FROM: Erin Trainor, Inspector

TO: File

REQUESTED BY: Andrew Spejewski

I. Background Information

- A. Date, Time of inspection: Tuesday, September 24, 2013, 9:30 AM
- B. Weather Conditions: Sunny, approximately 70 degrees F
- C. USEPA Representatives: Erin Trainor
Andrew Spejewski
- D. Site Representative(s): Domenic J. Sarno
Mayor, City of Springfield
Springfield City Hall
36 Court Street
Springfield, MA 01103

Note: The Site Representatives were not contacted during this inspection.

- E. Address: Various locations along Chicopee River, North Branch Mill River, and Schneelock Brook.

II. Purpose of Inspection

The purpose of the inspection was to identify illicit connections or illegal discharges within the City of Springfield municipal separate stormwater sewer system (MS4) that may adversely impact the water quality in the Chicopee River, North Branch Mill River, and Schneelock Brook, which are all tributaries of the Connecticut River. Samples were collected from six (6) stormwater outfalls in accordance with the Environmental Investigations and Analysis (EIA) unit Stormwater Program Plan.

III. Description of Sampling Locations

- Outfall located along Water Street directly upstream of a dam, identified at 18 (42.161139141 N, -72.502135448 W).
- Outfall located along Water Street directly upstream of Outfall 18, identified at 296A (42.160997525 N, -72.50128519 W). Note 296B, an approximate 4-inch green PVC pipe, was submerged at the time of the inspection, and was therefore not sampled.
- Outfall located at the intersection of Industry Avenue and Memorial Drive, identified as 90 (42.13936943 N, -72.540629124 W).
- Outfall located along Riverton Road directly across from the Laurelton Street intersection, identified as 223 (42.117855169 N, -72.530220812 W). Note: flow was heard in catch basin upstream of Outfall 223 in approximate 5 minute intervals.
- Outfall located along Riverton Road directly across from the Denver Street intersection, identified as 222 (42.117529551 N, -72.531097712 W).
- Outfall located at the end of Holcomb Road, identified as 215 (42.091668842 N, -72.516482541 W).

IV. Inspection Observations and Findings

On Tuesday, September 24, 2013, EPA inspectors Andrew Spejewski and Erin Trainor conducted an unannounced Compliance Sampling Inspection (CSI) within the City of Springfield, Massachusetts at six (6) locations throughout the City which discharge into the Chicopee River, North Branch Mill River, and Schneelock Brook.

The inspection started in Springfield at approximately 9:30 AM. At the time of the inspection, the weather was sunny and approximately 70 degrees Fahrenheit. According to www.wunderground.com, no rain was reported within 48 hours of the inspection and 0.95 inches of rain was reported within 72 hours of the inspection which was recorded at a weather station located in Chicopee, MA, approximately 3 miles from Springfield, MA.

The City of Springfield is covered under the National Pollution Discharge Elimination System (NPDES) General Permit for Stormwater Discharges from Small Municipal Separate Sewer Systems, and has been issued permit number MAR041023.

The sampling locations described in Section III were field screened using test kits for ammonia, chlorine, and surfactants and analyzed at the EPA New England Regional Laboratory (NERL) for E.Coli, Enterococcus, and pharmaceutical and personal care products (PPCPs) including: Atenolol, Acetaminophen, Cotinine, 1,7-Dimethylxanthine, Caffeine, Carbamazepine, and Metoprolol. In-situ measurements for conductivity, salinity, and temperature were also recorded. The following table summarizes the findings. Photographs are included.

Table 1: Summary of Springfield, MA MS4 Inspection – September 24, 2013

Sample ID	18	296A	90	223	222	215
Time	9:45	10:15	10:45	11:15	11:35	12:05
Latitude/Longitude	42.161139141 N / -72.502135448 W	42.160997525 N / -72.50128519 W	42.13936943 N / -72.540629124 W	42.117855169 N / -72.530220812 W	42.117529551 N / -72.531097712 W	42.091668842 N / -72.516482541 W
Description of Location	Outfall located along Water Street directly upstream of a dam.	Outfall located along Water Street directly upstream of the outfall identified as 18.	Outfall located at the intersection of Industry Avenue and Memorial Drive.	Outfall located along Riverton Road directly across from the Laurelton Street intersection.	Outfall located along Riverton Road directly across from the Denver Street intersection.	Outfall located at the end of Holcomb Road.
Physical Observations	Flow approx. 5 GPM. Concrete outfall approx. 36" diameter. Suds observed.	Flow approx. 5 GPM. Concrete outfall approx. 36" diameter. Slight musty odor.	Oval shaped outfall. Receiving water appeared to be murky. Suds observed. Cars running over manhole heard upstream.	Concrete outfall partially submerged. Outfall approx. 24" diameter. Flow was heard in catch basin upstream of Outfall 223 in approximate 5 minute intervals.	Approx. flow \leq 1 GPM. Concrete outfall approx 24" diameter.	Concrete outfall partially submerged. Outfall approx. 30" diameter. Receiving water appeared to be murky
Temperature, °C	14.0	14.3	16.0	15.5	13.6	12.4
Specific Conductivity, μ S	505	430.6	316.5	476.9	254	333
Salinity, ppt	0.2	0.2	0.2	0.2	0.1	0.2
Ammonia, mg/l	0	0.1	0.20	0.10	0.10	0.10
Total Chlorine, mg/l	0.04	0.05	0.01	0.04	0.02	0.16
Detergent, mg/l	0.05	0.20	0.10	0.20	0.10	0.10
Atenolol, ng/l	ND	ND	ND	ND	ND	ND
Acetaminophen, ng/l	ND	2.9	3.0	ND	ND	ND
Cotinine, ng/l	ND	0.37	12	0.47	0.51	1.3
1,7-Dimethylxanthine, ng/l	ND	3.4	12	3.0	3.8	2.6
Caffeine, ng/l	ND	5.3	120	3.9	12	5.2
Carbamazepine, ng/l	ND	ND	ND	4.0	ND	ND
Metoprolol, ng/l	ND	ND	ND	ND	ND	ND
E.Coli, MPN/100ml	8	1,549	54	6,212	80	526
Enterococcus, MPN/100ml	ND	262	20	2,909	223	305

GPM: gallons per minute, ND: Not detected above reporting limit



296A: Outfall located along Water Street directly upstream of the outfall identified as 18. Note 296B, an approximate 4-inch PVC pipe, was submerged at the time of the inspection, and was therefore not sampled.



Catch basin upstream of outfall 223 located along Riverton Road. Note flow was heard in catch basin in approximate 5 minute intervals.



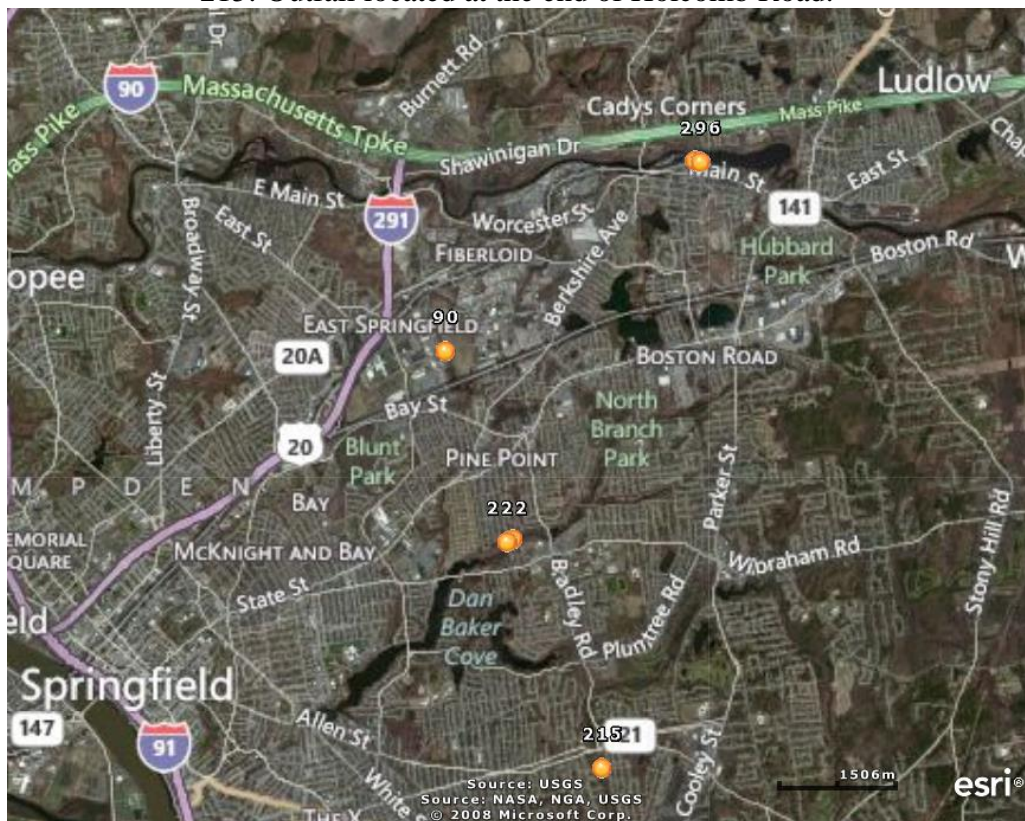
223: Outfall located along Riverton Road directly across from the Laurelton Street intersection



222: Outfall located along Riverton Road directly across from the Denver Street intersection.



215: Outfall located at the end of Holcomb Road.



View of sample locations.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region I - EPA New England

Author: Andrew Spejewski

Drafted Date:

I. Facility Information

- A. Facility Name:* Springfield, MA MS4
- B. Facility Location:* Springfield, MA
- C. Facility Contact:* Kevin Chafee, Natural Resources Manager
- D. Contact Mailing Address:* 36 Court St, Springfield, MA 01103
- E. Permit #:* MAR041023

II. Background Information

- A. Date of inspection:* 27 June 2012
- B. Weather Conditions:* Dry, clear
- C. US EPA Representative(s):* Andrew Spejewski
Bill Raich
- D. State/Local Representative(s):* None
- E. Previous Enforcement Actions:* None known

III Purpose of Inspection

Inspection was an audit of compliance with the City's Small Municipal Separate Storm System (MS4) permit.

IV Facility Description

The facility is the City's small Municipal Separate Storm Sewer System (MS4). Springfield includes both combined sewers and separate sewers; most of the city was originally separate, but the central/downtown area was combined; some of those combined sewers have since been separated.

V. Inspection

About June 11, 2012, Mr. Spejewski scheduled the inspection with Mr. Chafee.

The day of the inspection, Mr. Spejewski and Mr. Raich arrived at the City DPW offices on Tapley St. An opening conference was held with Mr. Chafee; John Rooney, Deputy Director DPW; Peter Shumly, DPW Engineer; Al Chwalek, Director DPW; and Chris Cignoli, City Engineer.

Mr. Spejewski and Mr. Raich later met separately with Mr. Chafee and with DPW personnel.

Mr. Spejewski and Mr. Raich later toured the DPW yard with DPW personnel. Following the tour, a brief closing conference was held and the inspection concluded.

Information below is from statements by City personnel unless otherwise noted.

Background:

The City covers 35.5 square miles and has a population of 153,000.

Nearly all of the city is on sanitary sewers; there may be a few septic systems remaining in outlying areas.

About 1/3 of the City is served by combined sewers; some separation projects have been completed.

The storm sewers are owned and maintained by the City (DPW), while sanitary sewers, including all combined sewers, are owned by the Springfield Water and Sewer Commission (WSC). The Commission also owns the regional POTW and provides drinking water to Springfield and several surrounding towns. The Commission is responsible for CSO management and control, including separation projects. The exception is catchbasins in the combined area, which the DPW is responsible for maintaining.

The separate storm sewer system is all gravity, with no pumps or other active components. There are no major interconnections with neighboring towns or other MS4s. There are no major storm systems other than the City's (other than interstate highways).

DPW staff believe there are about 320 outfalls (this may include CSO outfalls), an estimated 225 miles of separate storm sewer, and about 16000-18000 catchbasins.

CSO Program Management

Mr. Chafee stated that there is a stormwater committee that tries to meet monthly (although with the various weather emergencies in the last year, this goal was not met). There is a meeting scheduled for July. The committee includes representatives from the DPW, Facilities & Buildings (which includes school facilities), Planning/ConComm, Finance, the Water and Sewer Commission.

[Copy of Agenda from August 2010 meeting in file]

Mr. Chafee said he isn't the Director or otherwise in charge of the MS4 program; he just took responsibility for the annual report. Mr. Chafee wears two hats, as a member of the Planning Department, and as the Conservation Agent for the city.

Education

Mr. Chafee stated that the City contracts (for \$2,000/year) for education with the Connecticut River Stormwater Committee, a project of the Pioneer Valley Planning Commission. Mr. Chafee provided copies of a door hangar, a green lawn flyer and two stormwater pollution fact sheets (one for the automotive industry and one for businesses).

in general) [all in file]. Mr. Chafee stated he does not track the amounts of different materials distributed.

According to Mr. Chafee, at irregular intervals the DPW places 'No dumping' signs on catchbasins; some are customized for the particular watershed.

Mr. Chafee showed a powerpoint presentation on stormwater which he said he gave at about four elementary school classes in the last year. He also showed two model curricula made available for school teachers in the City.

Mr. Chafee stated that the rain barrel program mentioned in the annual report was handled by the Water and Sewer Commission.

Mr. Chafee said the water quality monitoring program was run by the Pioneer Valley Planning Commission, and focused on the Connecticut River. Mr. Chafee said he is one of the volunteers, who take samples and drop them off at the Planning Commission offices for analysis.

IDDE

Map

The City's original outfall map is on paper (it was produced at the inspection). Most of the map has now been entered into a GIS map (City staff stated a few areas have not yet been fully entered in the GIS system). Staff stated that occasionally the paper map would be consulted for details of particular locations.

The GIS map was demonstrated: water body names and outfalls were present on the map. The GIS system is linked to a comprehensive asset management program, which includes details of infrastructure such as outfalls.

Staff stated that interstate catchbasins (maintained by DOT) are included in the City map.

Separation

Staff again stated that the Water and Sewer Commission is fully in charge of separation projects. Staff believe that generally a new storm sewer line is added, ensuring that only proper connections are made to the storm line, but occasionally the old combined line is used for the storm sewer (with a new sanitary line).

There is no formal process for transferring control of the new storm sewer to the DPW; according to DPW staff, they have discussed whether there is a need for formal legal transfer of ownership and concluded it was not necessary.

The DPW stated they do not test new storm sewers to ensure there are no illicit connections; they believe that the WSC does all testing necessary to ensure there are no illicit connections.

Outfall Screening

Outfalls are screened by either DPW staff or interns working for Mr. Chafee in the Planning Department. DPW staff stated they have a goal of screening 20% of outfalls a year, but admit not all outfalls have been screened.

Screening data includes type and condition of the outfall and presence of odors, toilet paper or other signs of illicit connections; no sampling or testing is done.

Staff stated they are not doing sampling or testing at this point, but anticipate doing so as the new MS4 permit becomes effective.

Results of screenings by DPW staff are entered into the asset management system. The screenings done by Planning interns (about 40 outfalls) are at this point only on paper in a file in the Planning Department and are not entered into the computer systems.

Staff showed an example of an outfall with results in the computer system. Mr. Spejewski asked to see results for the outfall nearest the DPW yard (the paper map showed an outfall at Martone place). The outfall was located on the GIS system, but no screening results were present; DPW staff thought the outfall had not yet been screened.

DPW staff stated that there have been no outfalls found with signs of illicit connections. The last incident of illicit that DPW staff could remember was 5-6 years ago when signs of illicit were found in a manhole, leading to the removal of several houses improperly connected to the storm sewer.

Mr. Spejewski asked what the procedure would be if signs of an illicit connection were found. Staff answered that they would contact the WSC, who have equipment to TV lines.

DPW staff stated that the WSC would generally be in charge of investigating illicit connections, as they have authority over sanitary sewers. Staff stated that the WSC also has authority to order illicit connections removed, again because of their sanitary sewer authority.

Mr. Spejewski asked about illicit discharges or connections that were not sanitary sewers. DPW staff said that the DPW director has very broad powers and could issue orders. A copy of the city ordinances (from a city website) was printed [attached]. Staff stated City Police would do actual enforcement for dumping or other issues.

Complaints from outside parties (including residents) are tracked in a 311 system, and included in the asset management system. Staff stated complaints are generally about catchbasins that need cleaning.

Construction Site Control

Mr. Spejewski interviewed Kevin Chafee and DPW/Engineering staff separately on this issue

Kevin Chafee is the conservation agent, and does plan review and site inspections for all projects with jurisdictional wetlands. The review includes reviewing erosion controls as

well as post-construction wetland impacts. Mr. Chafee said that many projects (without on-site wetlands) that discharge to a storm drain become jurisdictional if the storm sewer eventually discharges to a wetlands. Mr. Chafee also said that during site inspections he will examine the entire site for erosion controls, not just the controls at a wetland. However, Mr. Chafee admitted that many sites are not under the Conservation Commission jurisdiction, and that Engineering (within the DPW) examines those. Mr. Chafee also said that there is not a lot of coordination between Engineering and him on erosion controls.

Mr. Chafee said he has issued orders, with one fine in the last 3-4 years. According to Mr. Chafee there are three active enforcement orders.

Mr. Chafee stated his training in erosion controls was mostly from the prior Conservation Agent, and DEP info sessions on erosion control.

The DPW/Engineering staff review site plans for all projects, and have a list of actively permitted sites.

For erosion control, the Engineering staff review erosion controls as part of site plan review. Engineering staff said they coordinate with Mr. Chafee if wetlands are present. The engineering staff also checks that an EPA construction stormwater permit has been obtained for sites above an acre.

Inspections are done informally, as staff go by sites or notice problems. About six engineering staff can look at sites. They are not logged or otherwise tracked. According to staff, Engineering sign-off was required at various project milestones, but this was eliminated for budget reasons. Engineering typically relies on the DPW road works group (which tracks, for instance, new curb cuts or paving) to be notified when a dormant project restarts.

Engineering staff also said that the road works group requires their contractors to obtain EPA construction stormwater permits.

If staff notice erosion control issues, typically an e-mail is sent to the developer. Staff said they have never fined or taken further action. Engineering staff believe that their ability to withhold issuing house numbers to a developer gives them sufficient leverage to get developers to comply with requests. Staff stated they have started putting more requests and conditions in writing, after seeing many developments go through multiple ownership changes.

Engineering staff are primarily civil engineers. Staff could not describe any formal erosion control training they have taken.

Post-Construction

Mr. Spejewski interviewed Mr. Chafee and Engineering Staff separately

Mr. Chafee stated that The Planning Department does not currently have site plan review, though City staff are attempting to modernize the zoning laws to provide for this.

For sites with jurisdictional wetlands, Mr. Chafee typically requires a long-term maintenance plan if there are structural controls.

DPW/Engineering staff stated that they review all site plans. According to staff their goal is complete retention of a 10 year storm, but this is not always possible for all sites. Staff generally prefer infiltration via perforated pipes or underground chambers rather than detention/retention basins, as basins are difficult to maintain.

Staff stated they look for a long-term maintenance plan during site review. They believe they don't have much authority over post-construction maintenance unless the discharge includes enough pollution to become an illicit discharge or something otherwise not zoned. Staff believe the proposed new bylaw will help, but think there will always be difficult cases.

Municipal Operations

The city has a large maintenance yard at the DPW HQ (see below for inspection). There is a private transfer station, but no city-owned one. School buses are privately owned and maintained. There is a separate police and fire garage.

The City is gradually moving its inventory of infrastructure to a computerized asset management system. The system map includes private catchbasins (catchbasins at a private mall were shown on the GIS map). The city is planning to add detention basins as well.

The city does not have a long-term maintenance and replacement plan for storm sewer infrastructure.

Catchbasin cleaning: The City has a vacuum truck for cleaning catchbasins. Catchbasins are cleaned first prioritizing places with complaints, then roads scheduled for repaving, as the city prefers to repair/replace damaged catchbasins when roads are repaved. Finally the city cleans on a regular schedule. Crews are assigned [<see attachment>]

DPW personnel stated the goal is to clean each catchbasin at least once in five years, though areas with flooding are cleaned much more regularly (these areas are not formally documented; it is personal knowledge that directs crews to these areas).

Catchbasin cleaning sediment, along with street sweepings, are sent to a landfill.

Street Sweeping: the City has 2-4 brush sweepers in operation at any given time. The entire city was done three times (some areas a fourth time) in the last year. The DPW tries to sweep entire city by June each year, then continues.

The city weighs the collected sweepings.

School parking lots and driveways are swept at the request of the school department; the DPW apparently does not track this.

De-icing: the city currently uses sand and salt but is phasing out sand. Salt is stored in a shed; loading is mostly outside, though as the amount of salt diminishes, the loader gets farther into the shed. The city weighs each truck after loading, to track the amount of salt. The city aims to calibrate spreaders for 300 pounds/lane-mile (the spreaders are generally not ground-speed controlled). The city pre-wets the salt, by spraying calcium chloride brine onto the top of the salt after it is loaded into the truck hopper.

For training, the DPW has several videos relating to pollution prevention and stormwater, though DPW admits they have not been shown in a while.

DPW Yard

The DPW yard includes a large building including a large vehicle maintenance garage and significant office space, with a parking lot in front, a paved area behind, a large paved storage area to one side, a salt shed, and truck scale. According to DPW personnel the building was formerly a mail sorting facility.

The parking lots and paved areas include catchbasins that, according to DPW personnel, drain to the combined system.

The paved areas had moderate amounts of sediment and some trash and other debris, though no signs of major spills or other problems.

On the rear of the building, a white storage unit (about 4 feet tall) was marked 'Hazardous Waste' and locked. Inside were multiple containers of 5 gallons or so, mostly unmarked. The marked containers appeared to contain unused cleaning fluid.

The vehicle bay is a very large open area running nearly the length of the building, with room for five or six open vehicle bays. Multiple floor drains are present; according to DPW personnel, they go through an oil water separator and then to the combined sewer system.

The building is heated by two waste oil burners; the tanks on each were stated to be 480 gallons; it was unclear if the tanks were double-walled and there was no other containment. Two large plastic totes (in the 500 gallon range) were marked "Used Oil and Deisel"; they had no apparent secondary containment. Two 500-gallon tanks hold motor oil and lubrication oil, which is then pumped across the building to several dispensers in the vehicle bays. The new oil and lube tanks sit inside a concrete containment structure.

There were many 55-gallon drums of various kinds of vehicle and motor oils (at least 19). Most were on containment pallets, but three drums, apparently recently delivered were not.

Mr. Spejewski met Bill Pianka, the Fleet Manager. Mr. Spejewski asked if there was a SPCC plan for the facility, and MP was unaware of any such plan. Mr. Pianka was able to produce receipts from the contractor that cleans the oil/water separator, dated 8/23/10 and 6/12/12.

Outside, a vacuum and brush sweeper were parked.

The salt storage shed is covered, though loading is done outside. The facility includes a scale used to weigh loaded salt trucks. There was some salt staining but not an excessive amount.

At this point, Mr. Spejewski completed the DPW tour.

Pictures, DPW Yard:

(Note: Inspector's camera malfunctioned, so pictures were taken with Mr. Spejewski's personal cell phone)

20120627_110805.jpg	Storage container on rear of building
20120627_111044.jpg	storage area inside building
20120627_111148.jpg	maintenance bay
20120627_111255.jpg	waste oil collection
20120627_111415.jpg	Interior of storage container on rear of building
20120627_111556.jpg	waste oil burner
20120627_111719.jpg	tanks in maintenance bay
20120627_111902.jpg	oil tank (for dispensers)
20120627_112029.jpg	lube and other material storage
20120627_112044.jpg	material storage
20120627_112047.jpg	storage for lube, etc.
20120627_112111.jpg	waste oil burner tank
20120627_112359.jpg	storage at maintenance bay
20120627_112401.jpg	maintenance bay with oil storage
20120627_112410.jpg	used oil collection
20120627_112955.jpg	dispenser pump for new oil
20120627_112957.jpg	pump nozzle for new oil
20120627_114615.jpg	vaccum truck
20120627_114618.jpg	brush sweeper
20120627_114620.jpg	salt storage shed



EPA Region 1 Clean Water Act Inspection Data Entry Form: 3560EZ

Version 1.02

Inspector:	Andrew Spejewski	Date form completed:	6/19/2015
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Section A: Facility Information

Inspection start date:	8/1/2013	Inspection start time:	10:30 AM
Inspection end date (if more than one day):	8/2/2013	Inspection finish time:	2:30 pm
NPDES ID:	MAR041023	Federal facility?	Choose an item
Name and Location of Facility Inspected:			

Name:	City of Springfield MS4				
Address:	70 Tapley St				
City:	Springfield	State:	MA	ZIP:	01104

Facility Representative #1:

Name:	N/A [recon]	Title:	Enter text		
Address (if off-site):	Enter text				
City:	Enter text	State:	Enter text	ZIP:	Enter text
Phone #:	Enter text	Email:	Enter text		

Facility Representative #2 (if necessary):

Name:	Enter text	Title:	Enter text		
Address (if off-site):	Enter text				
City:	Enter text	State:	Enter text	ZIP:	Enter text
Phone #:	Enter text	Email:	Enter text		

Section B: Compliance Monitoring Information

Clean Water Act Section (choose from only one of the following):

CWA §308[A][B]: NPDES	Stormwater - MS4
CWA §311: Oil and Hazardous Substances	Choose an item
CWA §404: Permits for Dredge and Fill Material	Choose an item

Compliance Monitoring Type:	Reconnaissance
Compliance Monitoring Reason:	Agency Priority

If Agency Priority, then specify priority(s):

OECA - CAFO	<input type="checkbox"/>
OECA - CAFO Region Initiative Areas	<input type="checkbox"/>
OECA - CSOs w/ < 50,000 service population	<input type="checkbox"/>
OECA - CSOs w/ >= 50,000 service population	<input type="checkbox"/>
OECA - MS4s Phase I	<input type="checkbox"/>
OECA - MS4s Phase II	<input checked="" type="checkbox"/>

OECA - SSOs ≥ 10 MGD and < 100 MGD	<input type="checkbox"/>
Region 1 - Environmental Justice	<input checked="" type="checkbox"/>
Region 1 - Green Economy / Green Infrastructure	<input type="checkbox"/>
Region 1 - Industrial Laundries	<input type="checkbox"/>
Region 1 - Lead Poisoning	<input type="checkbox"/>
Region 1 - Municipal Infrastructure	<input type="checkbox"/>
Region 1 - Pollution Prevention & Resource Conservation	<input type="checkbox"/>
Region 1 - Ship / Boat Yards	<input type="checkbox"/>
Region 1 - Wet Weather	<input checked="" type="checkbox"/>

Compliance Monitoring Agency Type:	EPA
Was this a Joint Compliance Monitoring Activity?	No
If Joint, which party had the lead?	Choose an item or leave blank if N/A
If State lead, what was the purpose of EPA participation?	Choose an item or leave blank if N/A

Section C: ICDS Information	
Did you observe deficiencies (potential violations) during the inspection?	Choose an item
Potential excess emission in violation of regulations:	<input type="checkbox"/>
Potential failure to... ... complete or submit a notification, report, certification, or manifest:	<input checked="" type="checkbox"/>
... follow a permit condition(s):	<input checked="" type="checkbox"/>
... follow a required sample monitoring procedure or laboratory procedure:	<input type="checkbox"/>
... follow or develop a required management practice or procedure:	<input type="checkbox"/>
... identify and manage a regulated waste or pollutant in any media:	<input type="checkbox"/>
... maintain a record or failure to disclose a document:	<input type="checkbox"/>
... maintain/inspect/repair meters, sensors, and recording equipment:	<input type="checkbox"/>
... obtain a permit, product approval, or certification:	<input type="checkbox"/>
... report regulated events such as spills, accidents, etc.:	<input type="checkbox"/>
Potential incorrect use of a material (pesticide, waste, product) or use of an unapproved material:	<input type="checkbox"/>
Potential violation of a compliance schedule in an enforceable order:	<input type="checkbox"/>
If you observed deficiencies, did you communicate the deficiencies to the Facility during the inspection?	Choose an item
If yes, did you observe the Facility take any actions during the inspection to address the deficiencies noted?	Choose an item
If yes, what actions were taken?	Choose an item
If the Facility reduced pollution, what pollutant was reduced?	Enter text
Did you provide <i>general compliance assistance</i> in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?	Choose an item
Did you provide <i>site-specific compliance assistance</i> in accordance with the policy on the role of the EPA inspector in providing compliance assistance during inspections?	Choose an item

Comments:
Enter text



**United States Environmental Protection Agency
Region I - EPA New England
5 Post Office Square
Boston, MA 02109-3912**

Confidential/FOIA Exempt/Attorney Client Privilege

Subj: Inspection Field Notes
City of Springfield MS4

From: Andrew Spejewski

Drafted Date: Aug 16, 2013

Finalized Date:

Reviewed By:

Reviewed Date:

To: File

I. Facility Information

A. Facility Name: City of Springfield MS4

B. Facility Location: 70 Tapley St
Springfield, MA 01104

C. Facility Contacts: N/A [recon]

D. Permit Number: MAR041023

II. Background Information

A. Date and time of inspection:
Facility entrance: August 1, 2013, 10:30 AM
Facility exit: August 2, 2013, 2:30 pm

B. Weather Conditions: Aug 1: cloudy, rain after 1:30pm
Aug 2: clear and dry

C. US EPA Representative(s): Andrew Spejewski

D. State/Local Representative(s): None

E. Previous Enforcement Actions: None

III Type and Purpose of Inspection

Reconnaissance to examine the City of Springfield's MS4 outfalls; looking for evidence of illicit connections and/or outfalls not properly screened.

IV Facility Description

The City of Springfield has an extensive separate storm sewer system (MS4). Portions of the city are also still combined (these portions are managed not by the City but by the Springfield Water and Sewer Commission).

The City has an MS4 general permit, still active.

V. Inspection

Aug 1:

Mr. Spejewski arrived in Springfield at about 10:00 AM. Weather was cloudy but dry until about 1:30, when light occasional rain began. Rain gradually became steady over the next hour until observations stopped for the day; at that point roads were wet, but there was no real water running off of them.

Mr. Spejewski drove to various locations in the City, parking on public roads and finding outfalls on foot.

Outfalls 77 and 76 (north and east of Indian Leap St) could not be located.

Outfall 172 (N of Water St at Cedar St) was a square brick-walled culvert. No flow.

Outfall 296 (N of Water St at Pinevale) was a large (perhaps 24") concrete pipe, with a small (perhaps 3") PVC pipe discharging about 5 feet below the concrete outlet. There was flow from both pipes. A sign was posted above the outfall (facing the road), indicating that this was City of Springfield CSO outlet #36.

Outfall 48 (N of Water St at Oak St): Was a large concrete pipe, trickle to minor flow.

North and East of Bircham St, South of Worcester St (rt 141), a streambed ran north from an outfall about 40 yards to a culvert inlet (apparently heading north under Worcester St). The outfall to the south (possibly outfall 112 or 307) had a trickle of flow. Two small outfall holes (possibly #305) were present in the concrete wall of the culvert inlet, discharging to the area just upstream of the inlet. These were both dry.

Outfall 306 (W of Bircham St, S of Worcester St) discharged to a dry streambed running west. The outfall was barely wet, not even quite a trickle of discharge.

Grochmal Avenue: Catchbasins were observed on Grochmal across from mobile home park, and near pump station at end of Grochmal. [There is no outfall nearby downstream of Grochmal on the City map]

Outfall 89 (N of Cottage St, W of Robbins) could not be located. The terrain seemed to indicate a streambed flowing north in this area, but it could not be located through vegetation.

Outfall 228 (E of Industry Drive (Robbins), S of Cottage) could not be located. A stream flows north to Cottage in this area, in a ravine well below the height of Cottage st and the surrounding terrain.

Outfall 228 (E of parking lot lying east of Industry Drive) could not be located.

Outfall 90 (NE of parking lot E of Industry at Memorial Drive): The outfall was mostly submerged in the flowing stream. However suds and a visible cloudy sheen could be clearly seen exiting the outfall and moving into the flow of the stream.

On Riverton road, the catchbasin on the north side of Riverton Road, just west of Laurelton, was again observed to have standing water with no flow, with sudden heavy flow into the catchbasin basin, flow ceasing within a minute.

Outfall 222 (S of Riverton Road at Laurelton): Outfall is partially submerged in a pool, but the outfall is the source of the stream, and flow leaving the pool downstream indicated flow was coming from outfall.

Outfall 223 (S of Riverton Road at Denver St): Small amount of flow coming from outfall (forming very small stream going S).

Outfall 188 (south of Grayson at Wallaston) – moderate flowing water, appeared clear.

Outfall 187 (south of Grayson at Slater) -- standing water was present below the outfall, but no flow away from pool was observed.

Outfall 186 (South of Grayson at Fox): The outfall was mostly submerged into large pool, with a stream flowing away from pool. On the north side of road (opposite outfall), standing water was present. The terrain suggests a stream flowing down from the north, through a culvert under Grayson.

Outfall 159 (XXXX) – could not locate in vegetation.

East of Royal St (Outfall 100 or 99). Only one outfall was located in this area. Standing water below the outfall, but no flow away from the pool.

Outfall 31 (N of Sunrise Terrace at Maebeth St) : outfall dry: extensive scouring and undermining below outfall has caused end of pipe to fall and break off.

Outfall 30 (N of Sunrise Terrace at Catalpa) : Outfall dry. Extensively scoured out below outfall.

Outfall 101 (N of South Branch Parkway at Bridle Path) – outfall dry.

Outfall 198 (N of South Branch Parkway at Clearbrook Dr) – outfall dry but staining, possible bacterial film on bottom of pipe.

[Observations ceased for Aug 1 at this time, as rain continued]

On August 2, observations began about 9:00 am. Weather was clear and dry throughout the day.

Outfalls 249, 253 , and 241 could not be located, due to vegetation or lack of access.

Outfalls 250, 63, 121, 122, 238 all appeared to be located behind residences with no public access.

Outfall 252 (N of Mandalay)—Outfall was dry, in good shape.

West of Plumtree, just north of Allen (possibly outfall 3?) Outfall has been undermined and five feet of pipe has broken and fallen. Moderate trickle coming out of/underneath pipe (hard to see).

Outfall 215 (West of Holcomb). Outfall was submerged, but apparently flowing (leaves and debris were washed out of pipe into pool).

Outfall 46 (West of Dark Forest road). Two pipe outlets were present in one concrete structure; one to north was barely wet, south was trickle flowing.

South of Talmadge. Mr. Spejewski spoke to a resident in his front yard, who confirmed the outfall was there, and thought it only flowed in wet weather. The resident gave permission to look for it, but it could not be located in heavy vegetation and very swampy ground.

Outfall 686 (East of Pebble Mill Road). Outfall was submerged in small pool, but no outflow from pool.

Outfall 684 (East of Stony Brook Road) Outfall was submerged in moderate pool along a stream. It did not appear that there was flow from the outfall into the pool.

Outfall 131 could not be located; surmised to be slightly farther north than marked, at south end of Trail Circle (likewise 132)

Outfall 133 (West of Greentree Circle). The outfall was a large concrete beehive shaped structure. No signs of outflow.

Outfall 136 (West of south end of Ramblewood drive). Outfall is a large concrete structure. No signs of outflow.

Outfall 135 (south of Pine Needle Lane) Outfall was observed from a distance; it was at the bottom of a large retaining wall, in a private yard. It was a beehive concrete structure. A stream appeared to emit from the foot of the retaining wall, but access to the foot of the wall could not be obtained.

W of Memorial Drive (?Outfall 116) – Memorial drive ends at a landfill, with access to the south side blocked by the landfill fence. Ponds and wetlands could be seen to the south. To the north side, in a gully, a stream flowed.

Outfall 117 (N of cottage, W of Brookdale) could not be accessed from either the east or south due to fences.

After these observations, Mr. Spejewski concluded the inspection and left the City

Picture list:

20130801_102438.jpg	Outfall 172, north of Water St
20130801_102909.jpg	Outfall 296, north of water st at Pinevale St
20130801_102922.jpg	Small PVC pipe discharging from outfall 296
20130801_103026.jpg	‘CSO Outfall’ sign above outfall 296 (facing north from Water St)
20130801_103409.jpg	Outfall 48, north of west end of Water St
20130801_104308.jpg	Outfall northeast of Bircham St at Caldwell Drive (#112 or #307)
20130801_104315.jpg	Outfalls in concrete structure forming inlet of culvert going north under Rt 141 just east of Bircham St
20130801_104402.jpg	Outfall 306 West of Bircham St
20130801_112531.jpg	Outfall 90 – east of Industry Ave
20130801_120649.jpg	Outfall 222, south of Riverton at Laurelton
20130801_120654.jpg	Stream flowing from outfall 222
20130801_121028.jpg	Outfall 223, south of Riverton at Denver
20130801_121032.jpg	Second picture of outfall 223
20130801_122404.jpg	outfall 188, south of grayson at Wallaston
20130801_122811.jpg	outfall 187, south of Grayson at Slater
20130801_124451.jpg	Outfall 186 and pool south of Grayson at Fox
20130801_124454.jpg	Stream flowing from pool south of Grayson at Fox
20130801_125754.jpg	Outfall 100/99 East of Royal St
Pictures Aug 2:	
20130802_094841.jpg	Outfall 252 (N of Mandalay)
20130802_101012.jpg	West of Plumtree north of Allen
20130802_101050.jpg	Outfall west of Plumtree
20130802_101119.jpg	Close-up outfall west of Plumtree
20130802_103441.jpg	Outfall 215, West of Holcomb.
20130802_104520.jpg	West of Dark Forest road (outfall 46)
20130802_104528.jpg	Close-up south pipe, west of Dark Forest Road

20130802_104531.jpg	Outfall 46, west of Dark Forest Road
20130802_111855.jpg	Outfall 686 – East of Pebble Mill Road
20130802_112413.jpg	Outfall 684 --East of Stony Brook Road
20130802_115052.jpg	Outfall 133- West of Greentree Circle
20130802_115441.jpg	Outfall 136 --West of south end of Ramblewood drive Top
view	
20130802_115448.jpg	Side view outfall 136
20130802_115453.jpg	[Accidental exposure]
20130802_115659.jpg	Outfall 135/ south of Pine Needle Lane
20130802_115704.jpg	Second view, outfall 135
20130802_133405.jpg	Culvert at north end of Memorial Drive, at landfill
boundary	
20130802_133411.jpg	Culvert North of Memorial Drive



United States Environmental Protection Agency
Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NDPES	yy/mm/dd	Inspection Type	Inspector	Fac Type
1 N	2	3	11 12 0 5 / 0 8 / 1 3	17 18 <	19 R 20
Inspection Type Description					
Stormwater-MS4-sampling					
Remarks					
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66					
Inspection Work Days		Facility Self-Monitoring Evaluation Rating		B1	QA
67 1 . 0 69		70		71	72
				73	74 75
				76	77 78 79 80

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) Seven outfalls within the Town of Springfield, Massachusetts	Entry Time/Date 9:00AM 5/8/2013	Permit Effective Date
	Exit Time/Date 13:15PM 5/8/2013	Permit Expiration Date
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s) No contact with the City of Springfield was made during this sampling inspection.	Other Facility Data: Receiving Water: Connecticut River	
Name, Address of responsible Official/Title/Phone and Fax Number. William E. Leonard, Carmen E. Serrano-Gerena and Daniel Rodriguez, Commissioners Springfield Water and Sewer Commission Phone: 413-787-6256 ext 111	Contacted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/> Permit	<input type="checkbox"/> Self-Monitoring Program	<input type="checkbox"/> Pretreatment	<input checked="" type="checkbox"/> MS4
<input type="checkbox"/> Records/Reports	<input type="checkbox"/> Compliance Schedules	<input type="checkbox"/> Pollution Prevention	
<input type="checkbox"/> Facility Site Review	<input type="checkbox"/> Laboratory	<input checked="" type="checkbox"/> Storm Water	
<input checked="" type="checkbox"/> Effluent/Receiving Waters	<input type="checkbox"/> Operations & Maintenance	<input checked="" type="checkbox"/> Combined Sewer Overflow	
<input type="checkbox"/> Flow Measurement	<input type="checkbox"/> Sludge Handling/Disposal	<input type="checkbox"/> Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments (Attach additional sheets of narrative and checklists as necessary)

SEV Codes	SEV Description
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Name(s) and Signature(s) of Inspector(s) Erin F. Trainor	
Agency/Office/Phone and Fax Numbers US EPA / EIA / p. (617) 918-8382 / f. (617) 918-8282	
Date 5/17/2013	
Signature of Management QA Reviewer	
Agency/Office/Phone and Fax Numbers	
Date	



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
One Congress Street, Suite 1100
Boston, MA 02114-2023

Memorandum - Enforcement Confidential

Date: 17 September 2008

Subj: NPDES Reconnaissance Inspection
Municipal Separate Storm Sewer System (MS4)
Town of Stoneham, MA
NPDES Permit No. MAS041062

From: Todd Borci

To: File

On Monday, 16 September 2008, EPA inspector Todd Borci and EPA laboratory representative Leah Bowe conducted an unannounced Reconnaissance Inspection (RI) of a portion of the Town of Stoneham, Massachusetts's (the "Town") Municipal Separate Storm Sewer System ("MS4") in Stoneham, MA.

On Monday, 16 September 2008, the EPA inspectors observed what is known as Sweetwater Brook in the central and western sections of the Town. EPA has been conducting extensive water quality sampling over the past several months in the Mystic River watershed in response to elevated bacterial concentrations in water quality samples from within the watershed. The upper portion of the Mystic River watershed is comprised of the Aberjona River and its tributaries. One of those tributaries is Sweetwater Brook, which originates in the Town of Stoneham. The surface water can first be observed just south of Lindenwood Street, where it emerges from a large (>12-foot diameter) culvert. The surface water flows south and west into the City of Woburn, where it discharges into the Aberjona River approximately 0.3 miles west of the Stoneham/Woburn boundary.

EPA has collected 14 surface water samples from several locations in Sweetwater Brook over the past several months, and nearly all have indicated elevated bacterial concentrations. On this particular day, EPA inspectors collected water quality samples from three locations in Sweetwater Brook. Sample "Kraft1" was collected from Sweetwater Brook just prior to the confluence with the Aberjona River in Woburn; Sample "100A" was collected from Sweetwater Brook off Maple Avenue, just prior to the stream entering a culvert under Route 93; and sample "1Linden" was collected just prior to the stream passing beneath the western portion of Lindenwood Street. After sampling of these locations was completed, EPA personnel walked portions of the banks of the surface water between Montvale Avenue and Lindenwood Street. EPA had previously collected samples here, and all results have indicated elevated bacterial concentrations.

During the site walk, EPA observed that a sewer manhole cover located approximately 20 feet east of Sweetwater Brook had discharged in the recent past, as toilet paper, paper towels, rags, and other sanitary debris were caught in the rim of the sewer manhole cover, and the same debris could be seen along the ground and stream bank to the north and the west and clearly had discharged into the stream via overland flow (See attached Photographs).

The same EPA personnel had last observed nothing unusual in this location on 12 August 2008, and therefore the sanitary sewer overflow (“SSO”) had to have occurred since that time. A review of National Oceanic and Atmospheric Administration (“NOAA”) records from both Logan International Airport in Boston, MA (located approximately 8.75 miles to the southeast) and Hanscom Field in Bedford, MA (located approximately 8.75 miles to the west) indicate that a large storm occurred on 6 and 7 September 2008, with between 1.74 inches (at Logan) and 3.95 inches (at Hanscom) falling in the area over a period of 14 hours on those two dates.

EPA will contact Massachusetts Department of Environmental Protection (“MassDEP”) personnel to determine if the Town of Stoneham has reported any SSO events in August or September 2008. EPA will contact the Town regarding both the SSO and the elevated bacterial concentrations once all data have been received.

Inspection occurred between 0945 and 1030 on 15 September 2008.

Attachment 1: Photographs.

Attachment 2: NOAA Precipitation Records.

End of Report.



Photo 1: Photo taken 9/15/08 at 10:17 am facing northwest. Manhole cover with toilet paper, paper towels, rags. Flow direction was toward northwest and west (left and top of photo) where Sweetwater Brook is located approximately 20 feet away.



Photo 2: Photo taken 9/15/08 at 10:17 am facing northwest. Same manhole as in Photo 1. Sweetwater Brook can be seen in background. SSO debris trails to Brook in both northwesterly and westerly direction.

5-4-06


 United States Environmental Protection Agency
 Washington, D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code	NPDES	yr/mo/day	Inspection Type	Inspector	Fac Type
1 <u>W</u> 2 <u>5</u> 3 <u>MA</u> <u>S</u> <u>0</u> <u>4</u> <u>1</u> <u>0</u> <u>6</u> <u>2</u> 11	12 <u>0</u> <u>9</u> <u>0</u> <u>7</u> <u>2</u> <u>1</u> 17	18 <u><</u>	19 <u>R</u>	20 <u>1</u>	
Remarks					
21 <u>Station</u> <u>in</u> <u>water</u> <u>for</u> <u>MS4</u> <u>Sampling</u> <u>ing</u>					
Inspection Work Days	Facility Self-Monitoring Evaluation Rating	BI	QA	Reserved	
67 <u>0</u> <u>6</u> 69	70 <u>1</u>	71 <u>1</u>	72 <u>1</u>	73 <u>1</u> <u>1</u> 74	75 <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> 80

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) <u>Town of Stoneham, MA 02180</u> <u>Stormwater /MS4</u> <u>Between Lindenwood + Montvale Ave</u>	Entry Time/Date <u>0750</u> <u>7/21/09</u>	Permit Effective Date <u>5/2003</u>
	Exit Time/Date <u>1220</u> <u>7/21/09</u>	Permit Expiration Date <u>8/2003</u>
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data (e.g., SIC NAICS, and other descriptive information)	
Name, Address of Responsible Official/Title/Phone and Fax Number <u>Robert Grover, Director</u> <u>Department of Public Works</u> <u>16 Pine St, Stoneham, MA 02180</u>		
Contacted <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/> Permit	<input type="checkbox"/> Self-Monitoring Program	<input type="checkbox"/> Pretreatment	<input type="checkbox"/> MS4
<input type="checkbox"/> Records/Reports	<input type="checkbox"/> Compliance Schedules	<input type="checkbox"/> Pollution Prevention	
<input type="checkbox"/> Facility Site Review	<input type="checkbox"/> Laboratory	<input checked="" type="checkbox"/> Storm Water	
<input type="checkbox"/> Effluent/Receiving Waters	<input type="checkbox"/> Operations & Maintenance	<input type="checkbox"/> Combined Sewer Overflow	
<input type="checkbox"/> Flow Measurement	<input type="checkbox"/> Sludge Handling/Disposal	<input type="checkbox"/> Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

SEV Codes	SEV Description
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
<u>Todd Bui</u>	<u>R1</u> <u>US EPA 617-918-1358</u>	<u>8/10/09</u>
Signature of Management Q A Reviewer	Agency/Office/Phone and Fax Numbers	Date



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Memorandum - Enforcement Confidential

Date: 8 February 2010

Subj: NPDES Compliance Inspection
Municipal Separate Storm Sewer System (MS4)
Town of Stoneham, MA

From: Todd Borci

To: File

On Wednesday, 3 February 2010, EPA inspector Todd Borci conducted an announced MS4 Inspection of the Town of Stoneham, Massachusetts's (the "Town") Municipal Separate Storm Sewer System ("MS4") system. The inspection consisted of meeting with Town representatives and field inspection of several outfalls.

At 0930 hours EPA began inspecting a number of outfalls in the Town. The first outfall observed was at the intersection of Tom's Way and Richardson Road. A perennial stream exits a large (approximately 36") culvert at this location. EPA had collected surface water samples at this location last year that indicated elevated bacterial concentrations. Both citizen and EPA observations of this outfall have also indicated gray cloudy water and physical evidence of sanitary discharges in the past. On this day, no obvious signs of sanitary sewage were observed.

Next an open portion of an unnamed perennial stream was observed near the intersection of Elm and Collincote Streets was observed. EPA had detected elevated concentrations of bacteria at this location in 2009. The stream was observed to have a significant amount of orange "floc" along the bottom of the stream bed near the inlet to a culvert that conveys flow to the west, and some growth along the stream bed further upstream. Absent the vegetation that was present last year, the stream appears to flow from a large (greater than 36-inch culvert) from beneath a large parking lot. Access to the culvert opening would need to be via walking up the stream in waders or by receiving access through the parking lot of a nearby business.

Next several portions of a perennial stream were observed in the Waverly and High Streets area. Prior to the Town providing limited mapping information as part of its response to the AO, these locations were unknown and have not been sampled. No obvious visual or odor indications of sewage were observed. One or more locations in this area appear suitable as "background" sampling location before the culverted stream enters the downtown area.

Last, outfalls near Recreation Park (accessed via Dale Court) were observed. Outfalls in this area were unknown until the Town provided mapping, and therefore have not been sampled by EPA. What appears to be a large concrete headwall is located behind a fence just west of the park, and appears to be Town outfall OF025. Due to fencing along the park, it appears access to the outfall

would need to be from a parking lot off Pine Street. The stream bed is open for a couple hundred

Stoneham MS4 Inspection
February 8, 2010

feet, where the stream enters into another large culvert. To the east of the culvert opening a small, less than 12-inch diameter outfall was observed. The pipe appeared to be of plastic construction, and very bright orange staining and significant floc was observed on the bank below the pipe. A steady flow of less than 4 gallons per minute was observed, with no other obvious visible signs of contamination.

At 1300, EPA met with several Town representatives, including Public Works Director/Town Engineer Robert Grover, Bob Radigan of the sewer department, and representatives of the Town's stormwater consulting firm (Scott Haynes and Amy Anderson of Malcolm Pirnie). The Town is subject to a August 2009 EPA Administrative Order for MS4 and SSO violations, and Malcolm Pirnie has been hired by the Town to assist in bringing the Town into compliance with the Clean Water Act.

The meeting lasted several hours, and all facets of the Town's stormwater program were discussed. A significant portion of the discussion centered on the Town's past and proposed future investigation of several MS4 catchment areas, those portions of the MS4 that drain to Sweetwater Brook, a tributary to the Aberjona River. Last, the location of what appears to be chronic SSO location behind 41 Montvale Avenue was discussed. EPA observed repeated SSOs at this location in the fall of 2008. The Town cleared a significant amount of debris from the manhole in question, and installed a locking lid on the manhole. Based on the discussion at the meeting, the Town felt confident all other manhole elevations along this line are sufficient that the surcharging issue won't simply be passed down the line. EPA stressed the seriousness and importance of SSO prevention.

The next steps under the existing AO consist of the Town submitting a revised IDDE Plan and a CMOM Corrective Action Plan. In the mean time, the Town will be planning its investigations and conducting any sampling as appropriate.

The meeting concluded at approximately 1600 hours.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

MAR 28 2013

Mr. James G. Vacalis
City of Suffolk
P.O. Box 1858
Suffolk, VA 23434

Re: Docket No. CWA-03-2013-0074DN
Administrative Order for Compliance and Request for Information

Dear Mr. Vacalis:

The United States Environmental Protection Agency ("EPA") has reviewed the 2009 and 2010 Annual Reports that the City of Suffolk submitted to the Virginia Department of Conservation and Recreation to assess compliance with Virginia's General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems ("General Permit"). Based on the information disclosed in the Annual Reports, EPA has determined that the City: a) failed to adequately implement the minimum control measures required by the General Permit; and/or b) failed to adequately document compliance in the Annual Reports as required by the terms of the General Permit.

Enclosed with this letter is an Administrative Order and Request for Information ("Order and Request") issued pursuant to Sections 308(a) and 309(a) of the Clean Water Act ("Act"), 33 U.S.C. §§ 1318(a), 1319(a). This Order and Request contains findings that the City of Suffolk has violated Section 301 of the Act, 33 U.S.C. § 1311 and requests further information regarding these findings, including any subsequent corrective action or any additional documentation absent from the Annual Reports which demonstrates compliance. You should carefully read the contents of the enclosed Order and Request and communicate to each responsible official, agent or employee the actions which each such person must take to ensure compliance with its terms. Failure to comply with the terms of the Order and Request may result in further enforcement action being taken, including a civil suit for penalties and injunctive relief that may be required to comply with the permit.



If you require any information or assistance regarding this matter, please contact Peter Gold,
NPDES Permits and Enforcement Branch, 215-814-5236.

Sincerely,

A handwritten signature in black ink, appearing to read "Jon M. Capacasa", with a long horizontal flourish extending to the right.

Jon M. Capacasa, Director
Water Protection Division
U.S. Environmental Protection Agency, Region III

Enclosure

cc: Ginny Snead, VADCR
Jerome Brooks, VA DEQ

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029**

IN THE MATTER OF:

City of Suffolk
441 Market Street
P.O. Box 1858
Suffolk, VA 23434

Docket No. CWA-03-2013-0074DN

**ORDER FOR COMPLIANCE
AND
INFORMATION REQUEST**

Respondent

I. STATUTORY AUTHORITY

- 1) This Order for Compliance and Request for Information ("Order and Request") is issued under the authority vested in the Administrator of the Environmental Protection Agency (hereinafter "EPA") under Sections 308(a) and 309(a) of the Clean Water Act ("CWA" or "the Act"), 33 U.S.C. §§ 1318(a), 1319(a). The Administrator has delegated these authorities to the Regional Administrator of EPA Region III, who in turn has delegated them to the Director of the Water Protection Division, EPA Region III.

II. STATUTORY AND REGULATORY BACKGROUND

- 2) Section 301(a) of the Act, 33 U.S.C. § 1311(a), prohibits the discharge of any pollutant by any person from a point source into the waters of the United States except in compliance with a permit issued pursuant to the National Pollutant Discharge Elimination System ("NPDES") program under Section 402 of the Act, 33 U.S.C. § 1342.
- 3) Section 402(a) of the Act, 33 U.S.C. § 1342(a), provides that the Administrator of EPA may issue a permit for the discharge of any pollutant from a point source to the waters of the United States. The discharges are subject to specific terms and conditions prescribed in the NPDES permit.
- 4) In 1975 EPA approved the Commonwealth of Virginia's program for controlling discharges of pollutants to navigable waters pursuant to Section 402(b) of the Act, 33 U.S.C. § 1342(b). In 1991, EPA authorized Virginia to issue General NPDES Permits.

- 5) In March 1975, EPA authorized Virginia's State Water Control Board to implement the NPDES program in the Commonwealth. On April 1, 1993, the State Water Control Board staff functions were merged by state legislative action into the Virginia Department of Environmental Quality ("DEQ"), which was created on that date. In 2004, the Virginia General Assembly adopted legislation that transferred the Virginia Pollutant Discharge Elimination System ("VPDES") stormwater construction program and the municipal separate storm sewer system ("MS4") permitting and enforcement responsibilities from DEQ to the Virginia Department of Conservation and Recreation ("DCR"). EPA approved DCR's program at the end of December 2004 and the programs were transferred to DCR on January 29, 2005.
- 6) On July 9, 2008, the Virginia Department of Conservation and Recreation ("DCR") issued General Permit No. # VA 04, the General Permit for Discharges of Stormwater from Small Municipal Separate Storm Sewer Systems ("the Permit"). The Permit is scheduled to expire on July 8, 2013.
- 7) EPA is authorized under Section 308(a) of the Act, 33 U.S.C. § 1318(a), to require the owner or operator of a point source to establish records and make such reports as may be necessary to carry out the objectives of the Act, including but not limited to:
 - a) Developing or assisting in the development of any effluent limitation, or other limitation, prohibition, effluent standard, pretreatment standard, or standard of performance;
 - b) Determining whether any person is in violation of any such effluent limitation, or other limitation, prohibition or effluent standard, pretreatment standard, or standard of performance; or
 - c) Carrying out Sections 1315, 1321, 1342, 1344 (relating to state permit programs) 1345 and 1364.
- 8) Section 309(a) of the Act, 33 U.S.C. § 1319(a), provides, *inter alia*, that whenever on the basis of any information available to him the Administrator finds that any person is in violation of any condition or limitation which implements. . . section 1342. . . he shall issue an order requiring such person to comply with such condition or limitation.
- 9) Small MS4s are regulated pursuant to Section 402(p) of the Act, 33 U.S.C. § 1342(p) and the regulations promulgated thereunder.
- 10) "Discharge of a pollutant" includes "any addition of any pollutant or combination of pollutants to waters of the United States from any point source." 40 C.F.R. § 122.2.
- 11) "Storm water" is defined as "storm water runoff, snow melt runoff and surface runoff and drainage." 40 C.F.R. § 122.26(b)(13).
- 12) The term "municipal separate storm sewer system" or "MS4" is defined as:

- a) "A conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, manmade channels, or storm drains) owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the Act that discharges to waters of the United States;" and
 - b) "Designed or used for collecting or conveying storm water. . ." 40 C.F.R. § 122.26(b)(8)(i).
- 13) A "small municipal separate storm sewer system" or "small MS4" is defined as all separate storm sewers that are:
 - a) "Owned or operated by the United States, a State, city, town, borough. . . or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, storm water, or other wastes. . ." And
 - b) "Not defined as 'large' or 'medium' municipal separate storm sewer systems. . ." 40 C.F.R. § 122.26(b)(16).
- 14) Operators of small MS4s are required to obtain NPDES permit coverage if the small MS4 is either:
 - a) "[L]ocated in an urbanized area as determined by the latest Decennial Census by the Bureau of the Census." Or
 - b) "[D]esignated by the NPDES permitting authority. . ." 40 C.F.R. § 122.32. *See also* 4 VAC 50-60-400.
- 15) Section II.A of the Permit requires the operator of a regulated small MS4 to "develop, implement and enforce a MS4 program designed to reduce the discharge of pollutants from the MS4 to the maximum extent practicable to protect water quality, to ensure compliance by the operator with water quality standards, and to satisfy the appropriate water quality requirements of the CWA and regulations."
- 16) Section II.A of the Permit states that "[i]mplementation of Best Management Practices ("BMPs") consistent with the provisions of an iterative MS4 Program . . . constitutes compliance with the standard of reducing pollutants to the maximum extent practicable. . ."
- 17) Section II.B of the Permit requires the MS4 Program include Minimum Control Measures ("MCMs") which address: 1) public education and outreach; 2) public involvement/participation; 3) illicit discharge detection and elimination; 4) construction site stormwater runoff control; 5) post-construction stormwater management in new

development and redevelopment; and 6) pollution prevention/good housekeeping for municipal operations.

- 18) Section II.E.3 of the Permit requires the Permittee to submit annual reports to DCR that report on the "status of compliance with permit conditions, an assessment of the appropriateness of the identified Best Management Practices ("BMPs"), and progress towards achieving the identified measurable goals for each of the MCMs."
- 19) Section III.L of the Permit requires the Operator to comply with all conditions of the Permit.

III. EPA FINDINGS AND ALLEGATIONS

- 20) City of Suffolk, Virginia ("Respondent") is a "person" within the meaning of Section 502(5) of the Act, 33 U.S.C. § 1362(5).
- 21) At all times relevant to this Complaint, Respondent owned and/or operated a regulated small MS4, located in Suffolk, Virginia.
- 22) Respondent's small MS4 discharged storm water into the Lake Kilby, Lake Meade, Lake Cahoon, Nansemond River, James River and associated tributaries, which constitute "waters of the United States" as that term is defined at 40 C.F.R. § 122.2.
- 23) Stormwater discharges from Respondent's MS4 to the Lake Kilby, Lake Meade, Lake Cahoon, Nansemond River, James River and associated tributaries are permitted only in accordance with the terms and conditions of a NPDES Permit.
- 24) The outfalls from Respondent's small MS4 constitute "point sources" as that term is defined at Section 502(14) of the Act, 33 U.S.C. § 1362(14).
- 25) Following issuance of the Permit, Respondent submitted a Registration Statement to DCR for coverage under the Permit. DCR subsequently approved Respondent for coverage.
- 26) During April 2011, EPA personnel conducted a review of Respondent's submitted annual reports from 2009 and 2010 located at the DCR Central Office in Richmond, VA (hereafter, "2011 File Review").

IV. VIOLATIONS

Count 1: MCM 3: Illicit Discharge Detection and Elimination

- 27) Section II.B.3.d of the Permit requires the Respondent to "develop and implement procedures to detect and address nonstormwater discharges, including illegal dumping, to the regulated small MS4."

- 28) Section II.E.3.b. of the Permit requires the Respondent to include “the status of compliance with permit conditions, an assessment of the appropriateness of the identified best management practices and progress towards achieving the identified measurable goals for each of the minimum control measures” in each of its annual reports.
- 29) Respondents MS4 Program Plan requires that the Respondent: “Continue implementing an illicit discharge detection and elimination program for the municipally-owned MS4 within the Urbanized Area. Track illicit discharge detection and elimination activities. Develop a dry weather screening program that includes inspection procedures, enforcement, public education, and where prescribed frequency is based on 10% of known outfalls in high risk areas are to be monitored annually by the end of the permit cycle.”
- 30) Based on EPA’s 2011 File Review Respondent either:
 - a) Failed to comply with the substantive requirements of its MS4 Program Plan in violation of the Permit; or
 - b) Failed to adequately document compliance with its MS4 Program Plan in violation of the Recordkeeping Requirements of the Permit.

Count 2: MCM 3: Illicit Discharge Detection and Elimination

- 31) Section II.B.3.e of the Permit requires the Respondent to “prevent or minimize to the maximum extent practicable, the discharge of hazardous substances or oil in the stormwater discharge(s) from the regulated small MS4. In addition, the MS4 Program must be reviewed to identify measures to prevent the recurrence of such releases and to respond to such releases, and the program must be modified where appropriate.”
- 32) Section II.E.3.b. of the Permit requires the Respondent to include “the status of compliance with permit conditions, an assessment of the appropriateness of the identified best management practices and progress towards achieving the identified measurable goals for each of the minimum control measures” in each of its annual reports.
- 33) Respondents MS4 Program Plan requires that the Respondent: “Prevent or minimize the discharge of hazardous substances and oil in the MS4 stormwater discharge. Yard inspections; Enhance reporting process with Fire Department/Haz Mat Team; targeted education.”
- 34) Based on EPA’s 2011 File Review Respondent either:
 - a) Failed to comply with the substantive requirements of its MS4 Program Plan in violation of the Permit; or
 - b) Failed to adequately document compliance with its MS4 Program Plan in violation of the Recordkeeping Requirements of the Permit.

Count 3: MCM 5: Post-Construction Stormwater Management

- 35) Section II.B.5.b.(1) of the Permit requires the Respondent to “develop and implement strategies which include a combination of structural and/or nonstructural best management practices (BMPs) appropriate for the operator's community. Where determined appropriate by the operator, the operator shall encourage the use of structural and nonstructural design techniques to create a design that has the goal of maintaining or replicating predevelopment runoff characteristics and site hydrology.”
- 36) Section II.E.3.b. of the Permit requires the Respondent to include “the status of compliance with permit conditions, an assessment of the appropriateness of the identified best management practices and progress towards achieving the identified measurable goals for each of the minimum control measures” in each of its annual reports.
- 37) Respondents MS4 Program Plan requires the Respondent to: “Encourage the use of LID as appropriate to local/regional conditions. Develop fact sheet/checklist to help developers and local staff determine appropriateness for LID project(s).”
- 38) Based on EPA’s 2011 File Review Respondent either:
 - a) Failed to comply with the substantive requirements of its MS4 Program Plan in violation of the Permit; or
 - b) Failed to adequately document compliance with its MS4 Program Plan in violation of the Recordkeeping Requirements of the Permit.

V. CONCLUSIONS OF LAW

- 39) Respondent failed to comply with the terms of the Permit as described above and is therefore in violation of Section 301 of the Act, 33 U.S.C. § 1311.

VI. COMPLIANCE ORDER & INFORMATION REQUEST

AND NOW, this 28th day of March, 2013, Respondent is hereby ORDERED, pursuant to Section 309(a) of the Act, 33 U.S.C. § 1319(a) to do the following:

- 40) Within thirty (30) days of the effective date of this Order, Respondent shall come into compliance with all requirements of the Permit.

Respondent is further REQUIRED, pursuant to Section 308(a) of the Act, 33 U.S.C. § 1318(a) to do the following:

- 41) Within thirty (30) days of the effective date of this Order, Respondent shall:
 - a. Provide additional evidence of compliance absent from the Annual Report where inadequate documentation is alleged in this Order; or

- b. Submit a work plan and a schedule to achieve compliance with all MCMs and/or BMPs which are noncompliant with the terms of the Permit as alleged in this Order. The work plan and compliance schedule shall be submitted to:

Mr. Peter Gold
U.S. EPA, Region III (3WP42)
1650 Arch Street
Philadelphia, PA 19103-2029

and

Ms. Ginny Snead, PE
DCR Division of Stormwater Management
Office of Regulatory Programs Manager
Virginia Department of Conservation and Recreation
203 Governor Street, Suite 206
Richmond, VA 23219

- c. Pursuant to 40 C.F.R. § 122.22 all submissions must be accompanied by the following certification: *"I certify that the information contained in or accompanying this submission is true, accurate, and complete. As to the identified portion(s) of this submission for which I cannot personally verify its truth and accuracy, I certify as the company official having supervisory responsibility for the person(s) who, acting under my direct instructions, made the verification, that this information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

VII. GENERAL PROVISIONS

- 42) Issuance of this Order and Request shall not be deemed an election by EPA to forego any administrative, civil, or criminal action to seek penalties, fines, or any other appropriate relief under the Act for the violations cited herein. EPA reserves the right to seek any remedy available under the law that it deems appropriate for the violations cited. Failure to comply and/or respond to this Order and Request, or providing misleading or false information, may subject you to civil and/or criminal sanctions pursuant to, 33 U.S.C. § 1319, and/or a civil judicial action initiated by the U.S. Department of Justice.
- 43) This Order and Request does not constitute a waiver or modification of the terms or conditions of any NPDES permit. Compliance with the terms and conditions of this Order and Request does not relieve the Respondent of its obligations to comply with any applicable federal, state, or local law or regulation.
- 44) Issuance of this Order and Request does not affect EPA's authority to seek additional information under Section 308 of the CWA, 33 U.S.C. § 1318, or otherwise affect EPA's ability to enforce the Permit or enforce or implement the CWA.

VIII. JUDICIAL REVIEW

- 45) Respondent may seek federal judicial review of the Order for Compliance pursuant to Chapter 7 of the Administrative Procedure Act, 5 U.S.C. §§ 701-706. Section 706, which is set forth at <http://uscode.house.gov/download/pls/05C7.txt>, states the scope of such review.

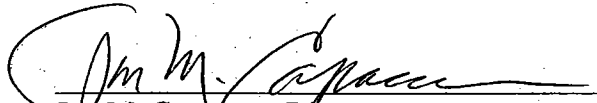
IX. OPPORTUNITY TO CONFER

- 46) Respondent is invited to confer with the Agency about the findings and conclusions reflected in this Order and Request and the terms and conditions contained herein. Any such conference can be in person or by electronic means. Respondent may also submit any written material it believes to be relevant to the Agency's determinations. If such a conference is desired, Respondent should contact Peter Gold at (215) 814-5236.

X. EFFECTIVE DATE

- 47) This ORDER AND REQUEST will become effective thirty (30) days after receipt unless modified or withdrawn.

Date: MAR 28 2013


Jen M. Capacasa, Director
Water Protection Division
U.S. EPA, Region III



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

December 07, 2011

Todd Borci - Mail Code OES04-4
US EPA New England R1

Project Number: 11110043
Project: Stacey Brook, MA
Analysis: E. Coli Defined Substrate
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 11/15/2011

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A107 / 9223.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

A handwritten signature in blue ink, reading "David F. McDonald". The signature is stylized with a large, looped "D" and "M".

David F. McDonald
Biology Laboratory Manager

Water Microbiology Laboratory Data Qualifier Codes

J = Estimate
H = Exceeds holding time
I = Exceeds incubation time
At = Atypical overgrowth
S = Lost sample
V = Insufficient sample volume
TNTC = Too numerous to count
MB = Media blank
+++ = Positive control
--- = Negative control
SP = Spiked Sample
L = Estimated, result below reporting limit (RL)
ND = Not Detected, result less than RL
D = Lab Duplicate
P = Plate counts outside preferred range

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Stacey Brook, MA
E. Coli Defined Substrate

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100 mL	RL MPN/100 mL	Qualifier
Stacey 03	AB24596	11/15/11 10:40 am	11/15/11 1:10 pm	E. Coli Defined Substrate	420	4	
Stacey N	AB24591	11/15/11 8:40 am	11/15/11 1:10 pm	E. Coli Defined Substrate	14210	100	
Stacey N	AB24593	11/15/11 9:11 am	11/15/11 1:10 pm	E. Coli Defined Substrate	13130	100	
Stacey N	AB24595	11/15/11 9:40 am	11/15/11 1:10 pm	E. Coli Defined Substrate	22240	100	
Stacey S	AB24594	11/15/11 9:35 am	11/15/11 1:10 pm	E. Coli Defined Substrate	1379	4	
Stacey S (	AB24590	11/15/11 8:35 am	11/15/11 1:10 pm	E. Coli Defined Substrate	806	4	
Stacey S (	AB24592	11/15/11 9:07 am	11/15/11 1:10 pm	E. Coli Defined Substrate	445	4	

Number of Samples: 7



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

December 07, 2011

Todd Borci - Mail Code OES04-4
US EPA New England R1

Project Number: 11110043
Project: Stacey Brook, MA
Analysis: Enterococcus in Water
Analyst: Nathan Raines

Date Samples Received by the Laboratory: 11/15/2011

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

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David F. McDonald
Biology Laboratory Manager

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Stacey Brook, MA

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection:	Date of Analysis	Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
Stacey 03	AB24596	11/15/11 10:40 am	11/15/11 1:10 pm	Enterococcus in Water	30	10	
Stacey N	AB24591	11/15/11 8:40 am	11/15/11 1:10 pm	Enterococcus in Water	749	10	
Stacey N	AB24593	11/15/11 9:11 am	11/15/11 1:10 pm	Enterococcus in Water	857	10	
Stacey N	AB24595	11/15/11 9:40 am	11/15/11 1:10 pm	Enterococcus in Water	504	10	
Stacey S	AB24594	11/15/11 9:35 am	11/15/11 1:10 pm	Enterococcus in Water	278	10	
Stacey S (	AB24590	11/15/11 8:35 am	11/15/11 1:10 pm	Enterococcus in Water	148	10	
Stacey S (	AB24592	11/15/11 9:07 am	11/15/11 1:10 pm	Enterococcus in Water	309	10	

Number of Samples: 7



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

December 07, 2011

Todd Borci - Mail Code OES04-4
US EPA New England R1

Project Number: 11110047

Project: Source Tracking - North Providence, RI

Analysis: Fecal Coliform by Membrane Filtration

Analyst: Nathan Raines

Date Samples Received by the Laboratory: 11/16/2011

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A102 / 9222D.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8609.

Sincerely,

A handwritten signature in blue ink that reads "David F. McDonald".

David F. McDonald
Biology Laboratory Manager

**Water Microbiology Laboratory
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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Source Tracking - North Providence, RI

Fecal Coliform by Membrane Filtration

Matrix: Water

Sample Number	Lab ID	Date of Collection: Date of Analysis		Compound	Concentration CFU/100 mL	RL CFU/100 mL	Qualifier
005-A	AB24619	11/16/11	1:00 pm	11/16/11 3:10 pm	Fecal Coliform by Membrane	16	4
005-B	AB24620	11/16/11	1:03 pm	11/16/11 3:10 pm	Fecal Coliform by Membrane	524	4
005-C	AB24621	11/16/11	1:05 pm	11/16/11 3:10 pm	Fecal Coliform by Membrane	1700	100
014A	AB24612	11/16/11	10:15 am	11/16/11 3:10 pm	Fecal Coliform by Membrane	32	4
014B	AB24613	11/16/11	10:20 am	11/16/11 3:10 pm	Fecal Coliform by Membrane	96	4
Brook Farm	AB24615	11/16/11	11:50 am	11/16/11 3:10 pm	Fecal Coliform by Membrane	1000	100
David St	AB24609	11/16/11	8:30 am	11/16/11 3:10 pm	Fecal Coliform by Membrane	20	4
Gerard	AB24617	11/16/11	12:30 pm	11/16/11 3:10 pm	Fecal Coliform by Membrane	8	4
Metcalf	AB24610	11/16/11	9:20 am	11/16/11 3:10 pm	Fecal Coliform by Membrane	1500	100
Milton	AB24611	11/16/11	9:50 am	11/16/11 3:10 pm	Fecal Coliform by Membrane	124	4
Mineral Spring	AB24616	11/16/11	12:25 pm	11/16/11 3:10 pm	Fecal Coliform by Membrane	156	4
Obed	AB24618	11/16/11	12:40 pm	11/16/11 3:10 pm	Fecal Coliform by Membrane	8	4
Smith 141	AB24614	11/16/11	11:30 am	11/16/11 3:10 pm	Fecal Coliform by Membrane	12100	100

Number of Samples: 13



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Water Microbiology Laboratory Report

December 07, 2011

Todd Borci - Mail Code OES04-4
US EPA New England R1

Project Number: 11110047

Project: Source Tracking - North Providence, RI

Analysis: Enterococcus in Water

Analyst: Nathan Raines

Date Samples Received by the Laboratory: 11/16/2011

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I method, A110.

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David F. McDonald
Biology Laboratory Manager

**Water Microbiology Laboratory
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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

Source Tracking - North Providence, RI

Enterococcus in Water

Matrix: Water

Sample Number	Lab ID	Date of Collection: Date of Analysis		Compound	Concentration MPN/100mL	RL MPN/100mL	Qualifier
005-A	AB24619	11/16/11	1:00 pm	11/16/11 3:45 pm	Enterococcus in Water	20	10
005-B	AB24620	11/16/11	1:03 pm	11/16/11 3:45 pm	Enterococcus in Water	10	10
005-C	AB24621	11/16/11	1:05 pm	11/16/11 3:45 pm	Enterococcus in Water	ND	10
014A	AB24612	11/16/11	10:15 am	11/16/11 3:45 pm	Enterococcus in Water	20	10
014B	AB24613	11/16/11	10:20 am	11/16/11 3:45 pm	Enterococcus in Water	20	10
Brook Farm	AB24615	11/16/11	11:50 am	11/16/11 3:45 pm	Enterococcus in Water	906	10
David St	AB24609	11/16/11	8:30 am	11/16/11 3:45 pm	Enterococcus in Water	31	10 H
Gerard	AB24617	11/16/11	12:30 pm	11/16/11 3:45 pm	Enterococcus in Water	ND	10
Metcalf	AB24610	11/16/11	9:20 am	11/16/11 3:45 pm	Enterococcus in Water	2909	10 H
Milton	AB24611	11/16/11	9:50 am	11/16/11 3:45 pm	Enterococcus in Water	85	10
Mineral Spring	AB24616	11/16/11	12:25 pm	11/16/11 3:45 pm	Enterococcus in Water	30	10
Obed	AB24618	11/16/11	12:40 pm	11/16/11 3:45 pm	Enterococcus in Water	20	10
Smith 141	AB24614	11/16/11	11:30 am	11/16/11 3:45 pm	Enterococcus in Water	211	10

Number of Samples: 13



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 Post Office Square
Boston, MA 02109-3912

Memorandum - Enforcement Confidential

Date: 20 December 2011

Subj: NPDES Compliance Sampling Inspection
Municipal Separate Storm Sewer System (MS4)
City of Lynn, MA and Town of Swampscott, MA

From: Todd Borci

To: File

On Tuesday, 15 November 2011, EPA inspectors Todd Borci and Doug Koopman conducted an unannounced Compliance Sampling Inspection (CSI) of the City of Lynn, Massachusetts (the "City") and the Town of Swampscott, Massachusetts (the "Town") Municipal Separate Storm Sewer System ("MS4") Stacey Brook outfalls. The Stacey Brook outfall consists of two large 10-foot by 10-foot box culverts that discharge onto Kings Beach along Nahant Bay at the municipal boundary of the Lynn, MA and Swampscott, MA.

At the time of the inspection weather was fair – partly cloudy with a slight breeze from the south and a temperature of approximately 60 degrees Fahrenheit. EPA collected three sample sets approximately 20 minutes apart from each separate box culvert (for a total of six sample sets), and collected one additional sample from a stormwater outfall discharging approximately 70 yards into the Swampscott outfall from the northern side of the culvert. EPA also conducted field kit analysis for ammonia for a seep discharging from what appears to be a leaking pipe on the south side of the Swampscott culvert approximately 75 yards from the culvert opening.

EPA collected sample sets from the opening of the southern Lynn-side culvert (Sample ID "StaceyS") at 0835, 0907, and 0935 hours. EPA collected surface water samples for laboratory analyses for bacteria (e. coli and enterococcus) and selected pharmaceutical compounds. EPA collected an additional grab sample for field processing of surfactants, ammonia, and total chlorine. Sample results can be seen in the attached spreadsheet.

EPA collected sample sets from the opening of the northern Swampscott-side culvert (Sample ID "StaceyN") at 0840, 0911, and 0940 hours. EPA collected surface water samples for laboratory analyses for bacteria (e. coli and enterococcus) and selected pharmaceutical compounds. EPA collected an additional grab sample for field processing of surfactants, ammonia, and total chlorine.

The Swampscott side culvert opening was easily accessed and the inspectors were able to walk upstream for some distance. At approximately 70 yards into the culvert, an approximately 18-inch storm drain on the northern side of the culvert was observed to be discharging less than 1 gallon per minute. EPA collected a sample set from this discharge at 1040 hours for laboratory analyses

for bacteria (e. coli and enterococcus) and selected pharmaceutical compounds. EPA collected an additional grab sample for field processing of surfactants, ammonia, and total chlorine.

Lynn/Swampscott CSI 11.15.11

Page 2

At approximately 75 yards into the culvert, a cast iron pipe (12 to 16 inches in diameter) passed through the culvert (approximately 4 feet from the bottom of the culvert and 3 feet from the top of the culvert). A slight dripping of liquid and a gray bacterial plaque was observed along the southern wall of the culvert where the pipe passed through. EPA was unable to collect sufficient sample to run for the full suite of tests, but was able to collect sufficient volume to run field kit analyses for ammonia, with results indicating an ammonia concentration exceeding the quantifiable range of the field kit (the kits can quantify results up to 6 mg/l and the observed color change indicated the concentration in the sample was higher than that concentration). The presences of gray bacterial plaque, concurrent with a high ammonia concentration, are potential indicators of sewage.

EPA observed several people walking along the beach. EPA notes someone walking the beach would need to pass through the Stacey Brook discharge to get from one side of the beach to the other.

Once received, the analytical data for this sampling effort will be attached to this report.

Inspection ended at 1230. Once the data is received EPA will evaluate for appropriate follow up.

End of Report.

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Transaction Code		NDPES		yy/mm/dd		Inspection Type		Inspector		Fac Type										
1	N	2		3		11	1	2	0	6	1	2	17	18	<	19	R	20		
Inspection Type Description																				
Remarks																				
21																				66
Inspection Work Days				Facility Self-Monitoring Evaluation Rating				B1		QA		Reserved								
67	2	.	5	69	70		71		72		73		74	75		80				

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) Town of Swampscott MA sample locations: Essex Ave, Pine Street, Norfolk Ave, Thomas Rd, Banks Road and Stacey Brook at Kings Beach Test kits were run at all sample locations as well as samples for Bacteria and Pharmaceuticals to be run at the lab		Entry Time/Date "6/12/12 "08:30 am	Permit Effective Date
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s) Victoria Masone and Carl Eckman were contacted during his sample event. Both employees of the town		Other Facility Data	
Name, Address of responsible Official/Title/Phone and Fax Number. Victoria Masone P.E Assistant Engineer Town of Swampscott MA <div style="text-align: right;"> Contacted <input checked="checked" type="checkbox"/> Yes <input type="checkbox"/> No </div>			

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/> Permit	<input type="checkbox"/> Self-Monitoring Program	<input type="checkbox"/> Pretreatment	<input type="checkbox"/> MS4
<input type="checkbox"/> Records/Reports	<input type="checkbox"/> Compliance Schedules	<input type="checkbox"/> Pollution Prevention	
<input type="checkbox"/> Facility Site Review	<input type="checkbox"/> Laboratory	<input checked="" type="checkbox"/> Storm Water	
<input type="checkbox"/> Effluent/Receiving Waters	<input type="checkbox"/> Operations & Maintenance	<input type="checkbox"/> Combined Sewer Overflow	
<input type="checkbox"/> Flow Measurement	<input type="checkbox"/> Sludge Handling/Disposal	<input type="checkbox"/> Sanitary Sewer Overflow	

Section D: Summary of Findings/Comments (Attach additional sheets of narrative and checklists as necessary)

SEV Codes					SEV Description

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Phone and Fax Numbers	Date
Douglas Koopman	USEPA, OES - SEW / 671- 918 - 1747	"6/26/12
Signature of Management QA Reviewer	Agency/Office/Phone and Fax Numbers	Date



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 Post Office Square
Boston, MA 02109-3912

Memorandum - Enforcement Confidential

Date: 20 December 2011

Subj: NPDES Compliance Sampling Inspection
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EPA collected sample sets from the opening of the southern Lynn-side culvert (Sample ID "StaceyS") at 0835, 0907, and 0935 hours. EPA collected surface water samples for laboratory analyses for bacteria (e. coli and enterococcus) and selected pharmaceutical compounds. EPA collected an additional grab sample for field processing of surfactants, ammonia, and total chlorine. Sample results can be seen in the attached spreadsheet.

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Lynn/Swampscott CSI 11.15.11

Page 2

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Once received, the analytical data for this sampling effort will be attached to this report.

Inspection ended at 1230. Once the data is received EPA will evaluate for appropriate follow up.

End of Report.

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I - EPA NEW ENGLAND**

DATE: Draft: 6/12/12
Final: 9/28/12

SUBJ: Sampling of Stormwater in Swampscott, MA.

FROM: Douglas Koopman, Environmental Engineer
Water Technical Unit

THRU: Denny Dart, Water Technical Branch Chief

TO: File

I. Background Information

Date of inspection: 6/12/12

Weather Conditions: No rain for several days, cloudy and temp in 70's

Inspectors: Doug Koopman, EPA Water Technical Unit
Erin Trainor, EPA NERL

II. Purpose and Scope of the Inspection

On June 12, 2012, selected storm water outfalls and manholes were sampled by EPA staff, to determine the level and extent of wastewater contamination getting into Stacey Brook. Stacey Brook discharges into Nahant Bay along the border of Swampscott and Lynn through a box culvert located at Kings Beach.

Illicit connections or illegal discharges entering Stacey Brook could adversely impact the water quality in Nahant Bay which is designated a Class SA water by the Commonwealth of Massachusetts. A Class SA designation [See 314 CMR 4.05(4)] indicates the water is an excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. The bacteria limits for a Class SA water body that is designated as a bathing beach is that no single enterococci sample taken shall exceed 104 colonies per 100 ml, and the geometric mean of the five most recent samples taken within the same bathing season (or most recent six months for samples taken outside of the bathing season) shall not exceed 35 enterococci colonies per 100 ml.

All samples obtained were collected as grab samples. Locations sampled during the inspection were screened using field test kits for ammonia (Hach Test Strips), chlorine (Hach Pocket Colorimeter II), and surfactants (R-9400). Samples from each location were also analyzed at the EPA New England Regional Laboratory (NERL) for E.Coli, Enterococcus, and selected Pharmaceutical and Personal Care Products (PPCPs). The PPCPs tested for included: Atenolol, Acetaminophen, Cotinine, 1,7-Dimethylxanthine,

Caffeine, Carbamazepine, and Metoprolol. In-situ measurements for conductivity, salinity, and temperature were also recorded at the time of sampling.

Inspectors Koopman and Trainor met with Ms. Victoria Masone (Swampscott Assistant Town Engineer) at her office at 8:30 am on the day of the sampling. Ms. Masone assigned Mr. Carl Eckman, a Town employee, to accompany the inspectors and help identify and remove the manholes for the sampling.

The following is a summary of the sampling locations and results which were obtained.

Table 1 - Summary of Sampling Locations and Screening Sampling Results

Sample Location	SWAMP01	SWAMP02	SWAMP03	SWAMP04	SWAMP05	SWAMP06
Time	9:00	10:00	10:45	11:15	11:45	12:30
Description of Location	Essex Avenue – DMH 014	Pine Street – DMH 039	Norfolk Avenue	Thomas Rd – Nearby 71 Thomas Road	Banks Road – DMH 041	Stacey Brook North - @ Kings Beach
Temperature, °C	14.8	14.7	13.3	15	14.8	15
Specific Conductivity, µS	680	493	232	262	373	1072
Salinity, ppt	0.3	0.2	0.1	0.2	0.2	0.5
Ammonia, mg/L	0.50	0.25	0.25	ND	0.25	ND
Total Chlorine, mg/L	0.05	0.03	0.03	0.36	0.66	0.79
Surfactants, mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25

ND – not detected above the associated detection limit

Reporting Limits

Surfactants Field = 0.1 mg/L

Ammonia Field = 0.1 mg/L

Total Chlorine = 0.02 mg/L

Table 2 - Summary of Sampling Results for selected Pharmaceutical and Personal Care Products (PPCPs) and Bacteria

Sample Location	SWAMP01	SWAMP02	SWAMP03	SWAMP04	SWAMP05	SWAMP06
Description of Location	Essex Avenue – DMH 014	Pine Street – DMH 039	Norfolk Avenue	Thomas Rd – Nearby 71 Thomas Road	Banks Road – DMH 041	Stacey Brook North
Atenolol, ng/L	ND	44	25	7.4	8.1	17
Acetaminophen, ng/L	97	650	1800	39	410	17
Cotinine, ng/L	4.1	6.6	5.0	6.1	5.5	7.5
1,7 – Dimethylxanthine, ng/L	450	170	170	51	250	ND
Caffeine, ng/L	630	1,800	1,200	30	610	360
Carbamazepine, ng/L	0.53	4.2	24	2.0	0.4	3.5
Metoprolol, ng/L	2.0	10	32	1.7	28	8.4
E. Coli, MPN/100 ml	7,945	7,890	3,683	218	1,230	ND
Enterococcus, MPN/100 ml	1,396	52	145	ND	10	ND

ND – not detected above the associated detection limit

Reporting Limits

E. Coli = 4 MPN/100 ml

Enterococcus = 10 MPN/100 ml

Photographic Log

6/12/12 Inspection



Essex Avenue – DMH 014



Pine Street – DMH 039



Norfolk Avenue



Thomas Road – Nearby 71 Thomas Road



Banks Road – DMH 041



Stacey Brook Outfall (North) – Kings Beach

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I - EPA NEW ENGLAND**

DATE: 11/6/12

SUBJ: Sampling of Storm Water in Swampscott, MA.

FROM: Neil Handler, Water Technical Unit
Erin Trainor, NERL

THRU: Denny Dart, Water Technical Branch Chief

TO: File

I. Background Information

Date of inspection: 9/20/12

Weather Conditions: Sunny and temperatures in the low 60's, approximately 0.6 " rain in the past 24 hours; Low tide occurred at approximately 9:00 am.

Inspectors: Erin Trainor, EPA NERL
Jack Melcher, Water Technical Unit
Neil Handler, Water Technical Unit

II. Purpose and Scope of the Inspection

On September 20, 2012, selected storm water outfalls and manholes in Swampscott, MA were sampled by EPA staff, to determine the level and extent of contamination getting into the storm water. The sampling focused mainly on the remaining Town of Swampscott storm water outfalls which had not been sampled during the 6/20/12 EPA sampling event. However, there were several locations from the 6/20/12 sampling event that were re-sampled (i.e., Thomas Road, Banks Road – DMH 041, and Stacey Brook North Outfall at King's Beach) for confirmation purposes.

A number of the outfalls including the discharge from Stacey Brook flow into Nahant Bay. Nahant Bay is designated a Class SA water by the Commonwealth of Massachusetts and illicit connections or illegal discharges entering the storm water could adversely impact the water quality of the bay. A Class SA designation [See 314 CMR 4.05(4)] indicates the water is an excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. The bacteria limits for a Class SA water body designated for primary and secondary contact recreation is that no single enterococci sample taken shall exceed 104 colony forming units ("cfu") per 100 ml, and the geometric mean of the five most recent samples taken within the same bathing season (or most recent six months for samples taken outside of the bathing season) shall not exceed 35 cfu per 100 ml.

All samples obtained were collected as grab samples. Locations sampled during the inspection were screened using field test kits for ammonia (Hach Test Strips), chlorine (Hach Pocket Colorimeter II), and surfactants (CHEMetrics K-9400). Samples from each location were also analyzed at the EPA New England Regional Laboratory (NERL) for E.Coli, Enterococcus, and selected Pharmaceutical and Personal Care Products (PPCPs). The PPCPs tested for included: Atenolol, Acetaminophen, Cotinine, 1,7-Dimethylxanthine, Caffeine, Carbamazepine, and Metoprolol. In-situ measurements for conductivity, salinity, and temperature were also recorded at the time of sampling.

Inspectors Trainor, Melcher, and Handler met at Kings Beach at 7:40 am to begin with the sampling of the Stacey Brook North Outfall. The Stacey Brook outfall, which consists of two large concrete box culverts that are approximately 8-ft x 10-ft, discharges onto Kings Beach at the municipal boundary of Lynn and Swampscott, MA. The north culvert discharges flow from Swampscott's municipal storm water system while the southern culvert discharges flow from Lynn's storm water system. At the time of sampling, Kings Beach had a large amount of red sea weed covering the entire beach including up to and into the mouth of the Stacey Brook Outfall. There was also a noticeable amount of red sea weed in the flow exiting from the Stacey Brook North Outfall at the time of EPA's sampling.

Carl Eckman, a Swampscott Town employee, accompanied us for the sampling of the Thomas and Banks Roads manholes. Mr. Eckman removed the manholes as well as helped direct traffic at these two locations.

EPA staff investigated a number of other outfall locations which we were unable to sample on 9/20/12. The location of the outfalls as they were identified on the Drainage Map provided the Town of Swampscott as well as the basis for not sampling is noted below.

King's Beach

Outfall 3	-	Outfall not visible	Outfall 4	-	Outfall not visible
Outfall 5	-	Outfall not visible	Outfall 6	-	No flow
Outfall 7	-	No flow			

Fisherman's (Blaney) Beach

Outfall 8	-	No flow	Outfall 9	-	No flow
Outfall10	-	No flow	Outfall15	-	No flow
Outfall16	-	No flow			

Whale's Beach

Outfall18	-	Outfall not visible	Outfall19	-	No flow
Outfall 20	-	No flow (partially buried)			

The following is a summary of the sampling locations and the results which were obtained.

Table 1 - Summary of Sampling Locations and Screening Sampling Results

Sample ID	SWAMP01	SWAMP11	SWAMP11D	SWAMP13	SWAMP22	SWAMP23	Thomas	Banks
Time	7:50	8:50	8:50	8:45	9:55	10:15	10:46	11:10
Description of Location	Stacey Brook North - @ King's Beach	Outfall 11 Fisherman's Beach	Outfall 11 Fisherman's Beach	Outfall 13 Fisherman's Beach	Outfall 22 Phillips Beach	Outfall 23 Phillips Beach	Thomas Rd – Nearby 71 Thomas Road	Banks Road – DMH 041
Comment	Large amt of seaweed in flow, no chlorine odor	24" Pipe, discharge appears clear	Duplicate Sample	24" Pipe, large amt of green algae at mouth of outfall	Culvert exit has rubber cover, flow drains from Palmer Pond	48" Pipe, good flow, no noticeable odor	Good flow, no noticeable odor	Good flow coming in from Banks Rd, natural gas odor
Temperature, °C	17.4	18.4	NA	18	17.4	17.5	18.8	18.2
Specific Conductivity, µS/cm	8,300	1,958	NA	4,746	522	2,460	260	230
Salinity, ppt	5.2	1.0	NA	2.6	0.3	1.3	0.1	0.1
Ammonia, mg/L	<0.25	0.5	NA	2.0	0.25	<0.25	<0.25	0.5
Total Chlorine, mg/L	<0.02	0.84	NA	<0.02	0.02	0.02	0.17	0.71
Surfactants, mg/L	1.0	0.25	NA	<0.25	<0.25	0.25	<0.25	<0.25

ND – not detected above the associated reporting limit

Reporting Limits

Surfactants Field = 0.25 mg/L

Ammonia Field = 0.25 mg/L

Total Chlorine Field = 0.02 mg/L

Table 2 - Summary of Sampling Results for selected Pharmaceutical and Personal Care Products (PPCPs) and Bacteria

Sample ID	SWAMP01	SWAMP11	SWAMP11D	SWAMP13	SWAMP22	SWAMP23	Thomas	Banks
Time	7:50	8:50	8:50	8:45	9:55	10:15	10:46	11:10
Description of Location	Stacey Brook North - King's Beach	Outfall 11 Fisherman's Beach	Outfall 11 Fisherman's Beach	Outfall 13 Fisherman's Beach	Outfall 22 Phillips Beach	Outfall 23 Phillips Beach	Thomas Rd - Nearby 71 Thomas Road	Banks Road – DMH 041
Atenolol, ng/L	64	ND (<2.0)		2.8	ND (<2.0)	ND (<2.0)	13	28
Acetaminophen, ng/L	1300	82		22	ND (<2.0)	ND (<2.0)	4.6	380
Cotinine, ng/L	22	7.0		5.9	7.2	14	2.7	7.5
1,7 – Dimethylxanthine, ng/L	140	45		16	2.8	4.7	17	170
Caffeine, ng/L	500	34		51	31	68	36	430
Carbamazepine, ng/L	15	0.58		13	ND (<0.4)	0.56	ND (<0.4)	ND (<0.4)
Metoprolol, ng/L	23	ND (<2.0)		6.3	ND (<2.0)	ND (<2.0)	ND (<2.0)	24
E. Coli, MPN/100 ml	10,810	310	ND	7,380	410	7,160	750	7,060
Enterococcus, MPN/100 ml	3,100	100	ND	200	100	860	ND	3,310

ND – not detected above the associated reporting limit

Reporting Limits

E. Coli = 100 MPN/100 ml

Enterococcus = 100 MPN/100 ml

Photographic Log

9/20/12 Inspection



Stacey Brook North Outfall @ King's Beach (9/20/12, Photo by Erin Trainor)



Outfall 11 – Fisherman's Beach (9/20/12, Photo by Erin Trainor)



Outfall 13 – Fisherman's Beach (9/20/12, Photo by Erin Trainor)



Outfall 20 – Whale's Beach (9/20/12, Photo by Erin Trainor)



Outfall 22 – Phillips Beach (9/20/12, Photo by Erin Trainor)



Outfall 23 – Phillips Beach (9/20/12, Photo by Erin Trainor)



Thomas Road Manhole (9/20/12, Photo by Erin Trainor)



Banks Road Manhole-DMH 041 (9/20/12, Photo by Erin Trainor)

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION I - EPA NEW ENGLAND**

DATE: Draft: 6/12/12
Final: 9/28/12

SUBJ: Sampling of Stormwater in Swampscott, MA.

FROM: Douglas Koopman, Environmental Engineer
Water Technical Unit

THRU: Denny Dart, Water Technical Branch Chief

TO: File

I. Background Information

Date of inspection: 6/12/12

Weather Conditions: No rain for several days, cloudy and temp in 70's

Inspectors: Doug Koopman, EPA Water Technical Unit
Erin Trainor, EPA NERL

II. Purpose and Scope of the Inspection

On June 12, 2012, selected storm water outfalls and manholes were sampled by EPA staff, to determine the level and extent of wastewater contamination getting into Stacey Brook. Stacey Brook discharges into Nahant Bay along the border of Swampscott and Lynn through a box culvert located at Kings Beach.

Illicit connections or illegal discharges entering Stacey Brook could adversely impact the water quality in Nahant Bay which is designated a Class SA water by the Commonwealth of Massachusetts. A Class SA designation [See 314 CMR 4.05(4)] indicates the water is an excellent habitat for fish, other aquatic life and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation. The bacteria limits for a Class SA water body that is designated as a bathing beach is that no single enterococci sample taken shall exceed 104 colonies per 100 ml, and the geometric mean of the five most recent samples taken within the same bathing season (or most recent six months for samples taken outside of the bathing season) shall not exceed 35 enterococci colonies per 100 ml.

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Salinity, ppt	0.3	0.2	0.1	0.2	0.2	0.5
Ammonia, mg/L	0.50	0.25	0.25	ND	0.25	ND
Total Chlorine, mg/L	0.05	0.03	0.03	0.36	0.66	0.79
Surfactants, mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25

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Photographic Log

6/12/12 Inspection



Essex Avenue – DMH 014



Pine Street – DMH 039



Norfolk Avenue



Thomas Road – Nearby 71 Thomas Road



Banks Road – DMH 041



Stacey Brook Outfall (North) – Kings Beach

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

[illegible]

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) • Outfall located along Kings Beach, identified as 01 • Outfall located along Fisherman's Beach, identified as 13 • Outfall located along Fisherman's Beach, identified as 11 • Outfall located along Phillips Beach, identified as 22 • Outfall located along Phillips Beach, identified as 23 • Access manhole located along Thomas Road, identified as Thomas • Access manhole located along Banks Road, identified as Banks	Entry Time/Date 7:30AM 9/20/2012	Permit Effective Date
	Exit Time/Date 11:30AM 9/20/2012	Permit Expiration Date
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data: Receiving Water: Nahant Bay Atlantic Ocean	
Name, Address of responsible Official/Title/Phone and Fax Number. Gino Cresta Director of Public Works, Town of Swampscott Phone: (781) 596-8860 Fax: (781) 596-8828	Contacted <input checked="checked" type="checkbox"/> Yes <input type="checkbox"/> No	

Section C: Areas Evaluated During Inspection (Check only those areas evaluated)

<input type="checkbox"/>	Permit	<input type="checkbox"/>	Self-Monitoring Program	<input type="checkbox"/>	Pretreatment	<input checked="" type="checkbox"/>	MS4
<input type="checkbox"/>	Records/Reports	<input type="checkbox"/>	Compliance Schedules	<input type="checkbox"/>	Pollution Prevention		
<input type="checkbox"/>	Facility Site Review	<input type="checkbox"/>	Laboratory	<input checked="" type="checkbox"/>	Storm Water		
<input checked="" type="checkbox"/>	Effluent/Receiving Waters	<input type="checkbox"/>	Operations & Maintenance	<input type="checkbox"/>	Combined Sewer Overflow		
<input type="checkbox"/>	Flow Measurement	<input type="checkbox"/>	Sludge Handling/Disposal	<input type="checkbox"/>	Sanitary Sewer Overflow		

Section D: Summary of Findings/Comments (Attach additional sheets of narrative and checklists as necessary)

SEV Codes					SEV Description
Name(s) and Signature(s) of Inspector(s)					Agency/Office/Phone and Fax Numbers
Erin F. Trainor					US EPA / EIA / p. (617) 918-8382 / f. (617) 918-8282
Neil Handler					US EPA / EIA / p. (617) 918-1334 / f. (617) 918-1810
John Melcher					US EPA / EIA / p. (617) 918-386 / f. (617) 918-8417
Signature of Management QA Reviewer					Agency/Office/Phone and Fax Numbers
					Date